guttation fluid guttation fluid guttation fluid guttation fluid intact/alfalfa intact/alfalfa intact/alfalfa intact/alfalfa l/sugar water posure/dandelion
guttation fluid guttation fluid guttation fluid intact/alfalfa intact/alfalfa intact/alfalfa intact/alfalfa l/sugar water posure/dandelion
guttation fluid guttation fluid intact/alfalfa intact/alfalfa intact/alfalfa intact/alfalfa l/sugar water posure/dandelion
guttation fluid intact/alfalfa intact/alfalfa intact/alfalfa intact/alfalfa l/sugar water posure/dandelion
ontact/alfalfa ontact/alfalfa ontact/alfalfa ontact/alfalfa l/sugar water posure/dandelion
ontact/alfalfa ontact/alfalfa ontact/alfalfa l/sugar water posure/dandelion
ntact/alfalfa ntact/alfalfa l/sugar water posure/dandelion
ntact/alfalfa I/sugar water posure/dandelion
l/sugar water posure/dandelion
posure/dandelion
avpocuro/apple
exposure/apple
all routes
ntact/alfalfa
ntact/alfalfa
tact/dust/corn
tact/dust/corn
oral/syrup
l/sugar water
l/sugar water
l/sugar water
l/sugar water
oral/syrup
oral
eld foraging
eld foraging
oral
oral
ssumed oral
ntact/leaves
ontact/sprav
l/sugar water
,
ntact/topical
ntact/topical ntact/topical

557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water
557	lab	imidicloprid	immunity/deformed wing virus	oral/sugar water
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
580	lab	imidicloprid	behavior/learning	oral/honey
601	cage	clothianidin	mortality	oral/sugar water
601	cage	imidicloprid	enzymes/aCHe activity	oral/sugar water
601	cage	imidicloprid	mortality/hyperactivity	oral/sugar water
601	cage	clothianidin	enzymes/aCHe activity	oral/sugar water
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water
603	lab	imidicloprid	brain morphology	oral/sugar water
612	lab	imidicloprid	ology/Development of hypopharyngea	oral/pollen/sugar water
612	lab	imidicloprid	electrophysiology	oral/pollen/sugar water
616	lab	imidicloprid	behavior/avoidance	contact/oral/dust
622	lab	imidicloprid	behavior/reflex	oral/sugar water
622	lab	mix - imidicloprid	behavior/reflex	oral/sugar water
635	lab	imidicloprid	mortality	oral/sugar water
635	lab	mix - imidicloprid	mortality	oral/sugar water
635	lab	imidicloprid	behavior/reflex	oral/sugar water
635	lab	mix - imidicloprid	behavio/reflex	oral/sugar water
654	lab	imidicloprid	acetylcholinesterase activity/brain	not stated
654	lab	imidicloprid	acetylcholinesterase activity/brain	not stated
662	field	clothianidin	mortality	contact/dust
662	field	imidicloprid	mortality	contact/dust
662	field	thiamethoxam	mortality	contact/dust
680	field	thiamethoxam	behavior/flower visits	field foraging
689	field	clothianidin	colony parameters	field exposure
690	field	clothianidin	colony parameters/collapse	maize flower foraging
690	field	imidicloprid	colony parameters/collapse	maize flower foraging
697	lab	imidicloprid	mortality	tilm method
697	lab	imidicloprid	mortality	film method
697	lab	imidicloprid	mortality	film method

744	lab	imidicloprid	feeding rate	oral/sugar water
744	lab	imidicloprid	survival/longevity	oral/sugar water
750	lab	clothianidin	mortality	contact/leaves
750	lab	clothianidin	mortality	contact/leaves
750	semi-field	clothianidin	mortality	contact
750	semi-field	clothianidin	colony parameter/strength	contact
750	semi-field	clothianidin	colony parameter/thermoregulation	contact
750	semi-field	clothianidin	colony parameter/behavior	contact
750	semi-field	clothianidin	colony parameter/flight	contact
753	lab	imidicloprid	capped brood rate	into laraval combs
753	lab	imidicloprid	pupation rate	into laraval combs
753	lab	imidicloprid	eclosion rate	into laraval combs
753	lab	imidicloprid	behavior/probosis extenion/PER	into laraval combs
758	lab	imidicloprid	mortality	oral/food
758	lab	imidicloprid	mortality	oral/food
783	lab	imidicloprid	genetic change/larval gene expression	oral formula
788	lab	thiamethoxam	sublethal/biomarkers	contact
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
820	lab	imidicloprid	behavior/distance travelled	oral/sugar water
820	lab	imidicloprid	behavior/interaction	oral/sugar water
820	lab	imidicloprid	behavior/time in food zone	oral/sugar water
823	lab	imidicloprid	behavior/foraging and waggle dance	oral
823	lab	imidicloprid	behavior/PEReflex	oral
833	field	thiamethoxam	behavior/homing rate	oral/sugar water
859	lab	imidicloprid	mortality	contact/topical
863	field	imidicloprid	colony parameter	oral supplements
865	field	clothianidin	mortality	contact/dust
865	field	imidicloprid	mortality	contact/dust
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/homing	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	clothianidin	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/homing rates	oral/sugar water
868	field	imidicloprid	behavior/homing	oral/sugar water
868	field	imidicloprid	behavior/foraging rate	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging/trip duration	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/feeding	oral/sugar water
884	semi-field	clothianidin	mortality	contact

895	field	combination of all	colony parameters	contact/foraging
915	field	imidicloprid	behavior/flower visits	contact/foraging
920	field	imidicloprid	colony parameter/survival	contact/foraging
935	lab	imidicloprid	mortality	oral/sugar water
978	field	clothianidin	mortality	contact/foraging
978	field	clothianidin	mortality	contact/foraging
984	lab	imidicloprid	behavior/reflex/PER	oral/sugar water
984	lab	imidicloprid	behavior/reflex	oral/sugar water
1005	lab	imidicloprid	development/cell death	oral/larval food
1011	semi-field	clothianidin	mortality	contact/oral/dust
1011	semi-field	clothianidin	behavior	contact/oral/dust
1023	lab	imidicloprid	morphology/acini diameter	oral/sugar water
1074	cage	imidicloprid	mortality	oral/pollen
1074	cage	imidicloprid	chronic food consu.	oral/pollen
1075	lab	imidicloprid	behavior/navigation	oral/pollen
1075	lab	imidicloprid	behavior/PEReflex	oral/pollen
1076	field	imidicloprid	colony parameter/collapse	unknown origin
1085	field	thiamethoxam	mortality	dust/corn
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
1107	lab	imidicloprid	genetic/change	oral/sugar water
1118	lab	imidicloprid	ethyl oleate production	oral/sugar water
1133	lab	imidicloprid	mortality	oral/sugar water
1133	lab	imidicloprid	immunity/Total haemolymph count	oral/sugar water
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1153	lab	imidicloprid	mortality/neurotoxicy	oral/food
1164	field	imidicloprid	behavior/activity	contact/foraging
1164	field	thiamethoxam	behavior/activity	contact/foraging
1171	field	clothianidin	mortality	contact/foraging
1180	cage	clothianidin	mortality	field exp./potato
1186	greenhouse	clothianidin	mortality	contact
1213	lab	imidicloprid	mortality	contact/filter paper
1236	lab	thiamethoxam	behavior/arching and wing block	oral/guttation fluid
1259	greenhouse	thiamethoxam	mortality	contact/oral/dust
1264	field	imidicloprid	colony parameters	contact/foraging
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imiaiciopria	mortality	all routes
1205	lab	imiaiciopria	mortality	all routes
1205	lab	imiaiciopria	mortality	all routes
1205	dei	imiaiciopria	mortality	all routes
12//	tield	imiaiciopria	colony parameter/collapse	contact foraging maize

1306	lab	thiamethoxam	mortality	spray
1306	lab	thiamethoxam	mortality	contaminated diet
1306	lab	thiamethoxam	mortality	ontact/contaminated surfa
1306	lab	thiamethoxam	mortality	contact/leaves
1312	field	imidicloprid	mortality	oral/sugar water
1312	field	imidicloprid	colony parameter	oral/sugar water
1312	field	imidicloprid	mortality	oral/sugar water
1312	field	imidicloprid	colony parameter	oral/sugar water
1312	field	imidicloprid	mortality	oral/sugar water
1314	lab	thiamethoxam	mortality	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	contact/topical
1314	lab	thiamethoxam	chronic/probiscus extension	contact/topical
1314	lab	thiamethoxam	locomotor	contact/topical
1314	lab	thiamethoxam	sugar respons3	contact/topical
1314	lab	thiamethoxam	learning	contact/topical
1358	field	imidicloprid	behavior/foraging	oral/sugar water
1370	field	thiamethoxam	mortality	contact/foraging
1370	field	thiamethoxam	mortality	contact/foraging
1400	lab	imidicloprid	behavior/foraging	oral/sugar water
1400	lab	imidicloprid	mortality	oral/sugar water
1408	lab	thiamethoxam	behavior/locomotion	oral/sugar water
1408	lab	thiamethoxam	behavior/PEReflex	contact/topical
1408	lab	thiamethoxam	behavior/locomotion/learning	oral/topical
1408	lab	thiamethoxam	behavior/reflex	topical contact
1419	lab	imidicloprid	electrophysiology	direct to antenae
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1532	field	clothianidin	colony parameter/weight	contact/foraging canola
1532	field	clothianidin	honey production	contact/foraging canola
1532	field	clothianidin	mortality	contact/foraging canola
1532	field	clothianidin	offspring production	contact/foraging canola
1532	field	clothianidin	Over-wintering	contact/foraging canola
1644	field	imidicloprid	mortality	contact/foraging
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
1708	cage	imidicloprid	mortality	oral/sugar water
1708	cage	imidicloprid	food intake	oral/sugar water
1708	cage	imidicloprid	behavior/foraging	oral/sugar water
1708	cage	imidicloprid	behavior/learning	oral/sugar water
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	imidicloprid	mortality	contact corn tassels

1709	lab	imidicloprid	mortality	contact corn tassel
1709	lab	clothianidin	mortality	contact corn tassel
1760	field	imidicloprid	behavior/activity	oral/food
1760	field	imidicloprid	mortality	oral/food
1760	field	imidicloprid	colony parameter/weight gain	oral/food
1760	field	imidicloprid	behavior/pollen carrying	oral/food
1760	field	imidicloprid	brood development	oral/food
1801	semi-field	imidicloprid	behavior/foraging	oral/sugar water
1802	lab	mix imidicloprid	mortality	oral/sugar water
1802	lab	mix imidicloprid	mortality	oral/sugar water
1803	field	imidicloprid	behavior/number foraging	ora/sugar water
1836	lab	imidicloprid	behavior/reflex	oral/sugar water
1836	semi-field	imidicloprid	behavior/learning	oral/sugar water
1839	lab	imidicloprid	behavior/symptoms	oral/sugar water
1845	lab	imidicloprid	behavior/PER	oral/sugar water
1845	lab	imidicloprid	histochemestry	oral/sugar water
1888	lab	imidicloprid	effects of long term exposure	oral/sugar water
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
1922	field	imidicloprid	behavior/foragaing	oral/sugar water
1923	semi-field	imidicloprid	behavior/foraging	contact and oral
1923	semi-field	imidicloprid	mortality	contact and oral
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1934	field	imidicloprid	ny parameters/summer dev/winter su	oral/sugar water
1943	lab	imidicloprid	imidicloprid binding site	head membranes
1949	lab	imidicloprid	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1954	lab	imidicioprid	mortality	oral/sugar water
1954	lab	imidicioprid	mortality	oral/sugar water
1954	lab	imidicioprid	mortality	oral/sugar water
1954	Iab	imidicioprid	mortality	oral/sugar water
1954	lab	imidicioprid	sublethal/food intake	oral/sugar water
1954	Iab	imiaicioprid	sublethal/tood intake	oral/sugar water
1954	ab La la	imidicioprid		oral/sugar water
1954	Iap	imiaicloprid	Denavior/PER	oral/sugar water

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1954	lab	metabolite of im.	behavior/PER	(
1954	lab	imidicloprid	behavior/PER	(
1970	lab	imidicloprid	mortality	
1970	lab	imidicloprid	mortality	
1970	lab	imidicloprid	mortality	
2060	lab	imidicloprid	behavior/gustatory threshold	
2060	lab	imidicloprid	behavior/locomotion	
2060	lab	imidicloprid	behavior/PER	
2060	lab	imidicloprid	histochemestry	
2095	lab	imidicloprid	behavior/PER	(
2096	lab	imidicloprid	mortality	(
2096	lab	metabolite of im.	mortality	(
2096	lab	metabolite of im.	mortality	(
2096	lab	metabolite of im.	mortality	(
2096	lab	metabolite of im.	mortality	(
2096	lab	metabolite of im.	mortality	(
2096	lab	metabolite of im.	mortality	(
2112	lab	imidicloprid	behavior/PER	
2139	semi-field	imidicloprid	behavior/foraging	(
2139	semi-field	imidicloprid	honey production	(
2139	semi-field	imidicloprid	colony parameter/weight gain	(
2139	semi-field	imidicloprid	colony parameter/offspring	(
2139	semi-field	imidicloprid	colony parameter/brood dev.	(
2139	semi-field	imidicloprid	colony parameter/brood dev.	(
2139	semi-field	imidicloprid	colony parameter/brood dev.	(
2139	semi-field	imidicloprid	mortality	(
2157	field	imidicloprid	behavior/orientation/foraging	(
2157	field	imidicloprid	behavior/orientation/foraging	(
2159	lab	imidicloprid	mortality	
2159	lab	imidicloprid	behavior/PER	
2159	cage	imidicloprid	behavior/flight	(
2159	cage	imidicloprid	behavior/learning	(
2160	lab	imidicloprid	mortality	(
2160	lab	imidicloprid	mortality	(
2162	Tunnel	imidicloprid	ony parameters/visits to feeding static	(
2162	Tunnel	imidicloprid	colony parameters/food intake	(
2162	Tunnel	imidicloprid	colony parameters/feeding duration	(
2183	field	imidicloprid	colony parameters/weight gain	
2183	field	imidicloprid	lony parameter/number returning be	
2183	field	imidicloprid	colony parameters/pollen carrying	
2183	field	imidicloprid	colony parameters/visits to flowers	
2183	field	imidicloprid	pollination/fruit set	
2183	field	imidicloprid	colony parameter/colony weight	
2183	tield	imidicloprid	colony parameter/colony growth	
2183	tield	imidicloprid	colony parameter/brood nest size	
2183	field	imidicloprid	colony parameter/comb size	
2183	field	imídicloprid	lony parameter/number returning be	

oral/sugar water oral/sugar water oral/solution oral/solution oral/solution contact/topical contact/topical contact/topical cranial injection oral/sugar water contact/topical oral/food/honey oral/food/honey oral/food/honey oral/food/honey oral/food/honey oral/food/honey oral/food/honey oral/food/honey oral/sugar water oral/sugar water oral/diet oral/diet oral/sugar water field exposure field exposure

2183	field	imidicloprid	colony parameter/pollen carrying	field exposure
2207	lab	imidicloprid	/Densitometric analysis for AL and mu	direct to brain
7242	lab	thiamethoxam	mortality	oral/sugar water
7260	lab	imidicloprid	mortality	contact/film
7260	lab	clothianidin	mortality	contact/film
7274	lab	thiamethoxam	Morphology/histochemistry/	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
7303	semi-field	clothianidin	mortality	talc/contact
7303	semi-field	clothianidin	colony parameter/strength	talc/contact
7346	lab	thiamethoxam	Enzymes/AChE activity	contact/acetone sol.
7352	field	thiamethoxam	behavior/foraging	oral/sugar water
7352	field	thiamethoxam	behavior/returning bees	oral/sugar water
7352	field	thiamethoxam	Behavior/returning bees	oral/sugar water
7390	lab	imidicloprid	mortality	oral/sugar water
7390	lab	imidicloprid	logy/Development of hypopharyngea	oral/sugar water
7391	lab	imidicloprid	mortality	oral/sugar water
7391	lab	imidicloprid	sub-lethal/disease status	oral/sugar water
7467	field	imidicloprid	behavior/foraging	contact/brassica
7467	field	imidicloprid	behavior/foraging	contact/brassica
7467	field	imidicloprid	behavior/foraging	contact/brassica
7532	field	imidicloprid	behavior/foraging	oral/sugar water
7533	tent		colony parameters/varied	field exposure
7556	semi-field	imidicloprid	mortality	contact/leaves alfalfa

23.3 mg/L	positive	wing block within 2 to 9 minutes
23.3 mg/L	positive	more toxic than clothianidin
6.25-100 mg/L	positive	wing block within 2 to 9 minutes
23.3 mg/L	positive	dose dependent
1.5-100 mg/L	positive	wing block within 1 hour
.02828kg a.i./ha	positive	97% mortality with 2 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
10 ppm	positive	85% fewer feeding visits
0.112 kg(a.i.)/ ha	positive	60% reduction in foraging
0.112 kg(a.i.)/ ha	negative	no significant difference
25.0 g a.i./ha	positive	100% mortality over two seasons
25.0 g a.i./ha	positive	87% mortality with shorter administration
25.0 g a.i./ha	positive	100% mortality over two seasons
25.0 g a.i./ha	positive	67% mortality with shorter administration
25.0 g a.i./ha	positive	57% mortality with shorter administration
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	negative	low mortality if bees exposed 3 days later
.168kg a.i./ha	positive	increased from 14% to 19% in 2 hours
.11kg a.i./ha	positive	33% mortality at 2 hours
2.53 μM (Ki)	positive	Strong binding
field exposure	positive	High mortality reported in 2012
field exposure	positive	High mortality reported in 2012
0.0428 ng a.i./L diet	positive	sub-lethal doses cause organ damage while metabolizing the pesticide.
2 μg/L	positive	70% increase in mortality in those with parasites
2 μg/L	positive	affected immune related genes
7.5-11.25 ng/bee	positive	unable to reach the hive
2.5 ng/bee	positive	longer flight paths
125 μg/L	negative	not significant
9.9ng/bee	positive	apoptosis of nerve cells confirmed and increased with dosage
1/10 LD50	positive	significant reduction of motor coordination
1/50 LD50	positive	return rate significantly lowered
1/5 of LD50	positive	could not discriminate between food and non food sources
1/100 of LD50	positive	loss of coordination
1/5 of LD50	positive	impaired sucrose metabolism
0.00583 ml/cm2	positive	100% mortality after 2.61 hours
0.00583 ml/cm2	positive	100% mortality after 1 hour
0.00583 ml/cm2	positive	100% mortality after 1.51 hours
21ng/bee	positive	supressed immune response
21ng/bee	positive	agonist of acetylcholine receptor disrupts immune response
10-30ng/bee	positive	virus replicated faster/dose dependent

10-30ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
0.1ug/bee	positive	learning and memory significantly impaired
.0325ng/bee	negative	abstract says positive for other markers
.0325ng/bee	positive	AchE activity much higher
0.24-0.30 ng/bee	positive	hyperactivity - tremors - higher mortality
0.12-0.24 ng/bee	positive	AchE activity much higher
.0325ng/bee	negative	no significant difference in mortality
0.809-8.09 ng/bee	positive	apoptosis of brain cells confirmed
2.1 (sugar water)	positive	hypopharyngeal glands significantly smaller
2.1 (sugar water)	negative	not significant
1.28 ng/bee	negative	not significant
1.8ng/bee	negative	not significant
1.8ng/bee	negative	not significant
1000 nmol/l	positive	mortality significantly higher
1000 nmol/l	positive	mortality significantly higher
1000 nmol/l	positive	significant impairment of all functions
1000 nmol/l	positive	significant impairment of all functions
295 nM	positive	inhibited ACHe response
200 nM	positive	inhibited ACHe response
1.25 mg/seed	positive	100% mortality with brief dusting
0.1 mg/seed	positive	
0.1 mg/seed	positive	87% mortality with brief dusting
; insecticide/20L of wa	positive	65% mortality with brief dusting
JL, 5000x diluted -at 2	negative	"The results indicated that clothianidin spraying of the rice field increased the
156 mL per 50,000	negative	study reported that there were other plants in the area that are favored over t
/150 mL per 50,000 s	negative	study reported that there were other plants in the area that are favored over t
0.25 ml/L	positive	mortality 4 times higher
0.50 ml/L	positive	mortality 4 times higher
0.75 ml/L	positive	mortality 4 times higher

0.08-125 ug/L	negative	no difference
0.08-125 ug/L	negative	no difference
5.12 ug/m2	positive	mortality increased over time
5.12 ug/m2 x 3 hours	positive	mortality increased over time
5.12 ug/m2	positive	mortality increased over time
5.12 ug/m2	positive	colony strength affected
5.12 ug/m2	negative	no change in thermoregulation
5.12 ug/m2	negative	no significant change
5.12 ug/m2	positive	flight activity higher in treated group
24 ng/larava	positive	signficantly different than control. Most removed by nurse bees
24 ng/larava	positive	pupation rates significantly affected
2000 ng/larava	positive	eclosion rates significantly affected from 2000 up
0.04 ng/larva	positive	significant olfactory impairment dose dependent
68ppb	negative	Formula was adjusted by Abbott and then retested providing stated results
96ppb	positive	Formula was adjusted by Abbot
200ppm	negative	significantly more dead than controls
2.56-51.16	positive	but there were changes in gene expression
0 μg/kg	control	1 of 4 colonies collapsed at 23 weeks
1 (4wk)/20 (9wk) µg/l	positive	3 of 4 colonies collapsed at 19-23 weeks
1 (4wk)/ 40 (9wk) μg/	positive	4 of 4 colonies collapsed starting at 16 weeks
} (4wk)/ 200 (9wk) μg,	positive	All colonies failed
5 (4wk)/ 400 (9wk) µg	positive	All colonies failed between 14 and 18 weeks
50-500 ppb	borderline	difference not considered significant
50-500 ppb	positive	lower dose no effect/ higher dose strong effect
50-500 ppb	positive	less interaction dose dependent
24 ppb	positive	no difference in foragaging but significant difference in dance
24-241 ppb	positive	Fewer PER responses that were further reduced by dose increase
1.34 ng/bee	positive	significant reduction in homing up to 31% failed to return to hive when hive reas
0.005-0.03 μg/bee	borderline	imidicloprid toxicity not affected by diet
5-20 ppb	positive	difficulty when exposed to other toxins as compared to controls
118-674 ng/bee	positive	100% mortality in high humidity starting at 20 minutes to 8 hours
30-3661 ng/bee	positive	100% mortality in high humidity
0.15-6ng/bee	positive	number of feeder visits decreased by up to 98%
0.15-6ng/bee	positive	at 3ng, reduced mobility observed
0.15-6ng/bee	positive	trip duration increased by 50% to 130%
0.15-6ng/bee	positive	time spent at feeder increased up to 47%
0.15-6ng/bee	positive	flight time to feeder increased up to 241%
0.15-6ng/bee	positive	flight time to hive increased up to 210%
0.15-6ng/bee	positive	intervals between feedings increased by 33% up to 993% respectively
0.15-6ng/bee	positive	80% fewer bees returned. Demonstrated distended bellies, legs shaking, death
0.5-2 ng/bee	positive	feeder visits reduced significantly
0.5-2 ng/bee	positive	duration of trips significantly affected
0.5-2 ng/bee	positive	time spent at feeder increased by up to 100%
0.5-2 ng/bee	positive	duration of trips significantly affected
1.5-3 ng/bee	positive	intervals between flights significantly increased
1.5-3 ng/bee	positive	time in hive increased
1 g a.i./ha (x≤160 µm)	positive	mortality significantly higher

varied negative "However, the risk exposure of bee colonies on adverse impact of pestic 0.02% positive number of visits to flowers reduced positive dust higher mortality, higher queen mortality and lower hive weight 50 ng/µl 1mM verapai borderline significantly higher mortality 1.25 mg/seed dust negative "Chemical analysis showed high quantities of neonicotinoid insecticide in dead g/seed dust 30 min. e positive 50-97% mortality 0.3-0.6 ng/bee positive PER significantly affected 0.3-0.6 ng/bee negative not significant 400 ppm positive high rate of apoptosis 0.5-2 g a.i./ha positive mortality increased with dosage 0.5-2 g a.i./ha positive risk greatest at edge of field 1 ppb positive acini declined by dose 20% mortality compared to 15% 48ng/g negative 48ng/g positive consumption of treated pollen significantly less 48ppb positive navigation significantly impaired 48ppb positive not significant 27 (14-39) ng/g positive colonies contaminated by unknown source of neonics. 7.35 g a.i./ha20% positive mortality significantly higher 7.35 g a.i./ha50% positive foraging behavior significantly impaired 10mg.l positive The AccGtpx-1 gene was induced after treatments with imidacloprid  $7 \,\mu g/kg$ negative not significant 0.7-70 μg/l positive Highest mortality in bees infected with Nosema 0.7-70 µg/l negative not significant ix10-6-1.5x10-3 m/ml positive especially high mortality in bees with virus x10-6-1.5x10-3 m/ml positive highest mortality in younger bees ix10-6-1.5x10-3 m/ml positive 90% mortality ix10-6-1.5x10-3 m/ml positive younger bees regurgitated but were damaged ix10-6-1.5x10-3 m/ml negative In Malpighian tubules treated with insecticide a smaller basophilic was observe 500 ng/kg positive Decrease in HPG acinal diameter with exposure duration. 0.004-0.008 % a.i. positive Activity less with exposure 0.004-0.008 % a.i. positive Activity less with exposure (1.8) (ng/bee) positive mortality significantly higher general exp. positive mortality increased over time unknown positive averaged 123 dead bees per colony at day 1 25 g a.i./ha positive 50% mortality in 24 hours 47 mg/L positive wing block within 2 to 6 minutes 200 g/ha positive 100% mortality after 330 minutes varied negative not significant 25.0 g a.i./ha positive 100%mortality at 0 hours aged residue 25.0 g a.i./ha positive 87% mortality over two seasons for 1 hour residue 25.0 g a.i./ha positive 74% mortality for 4 hour residue 25.0 g a.i./ha positive 64% mortality for 8 hour residue 25.0 g a.i./ha positive 41% mortality for 24 hour aged residues 25.0 g a.i./ha positive 22% mortality for 48 hour aged residues 25.0 g a.i./ha positive 15% mortality for 72 hour aged residues 25.0 g a.i./ha positive 7.5% mortality for 120 hour aged residues dust negative "However, additional studies are needed to better understand possible synerg

150 g/100L H2O	positive	71% mortality after 1 hour, 100% mortality after 9 hours
150 g/100L H2O	positive	99% mortality at 24 hours
150 g/100L H2O	positive	56% mortality 1 hour after contact
150 g/100L H2O	positive	100% mortality at 9 hours
3.55 ng a.i./L	negative	neurotocity determined
3.55 ng a.i./L	negative	"Our observations point towards decays of overall colony vitality
3.55 ng a.i./L	negative	
3.55 ng a.i./L	negative	
3.55 ng a.i./L	negative	study abstract says positive for all but one endpoint
0.1-1 ng/bee	negative	
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeyb
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed
0.1-1 ng/bee	negative	"Thiamethoxam by contact induced either a significant decrease of olfac
0.1-1 ng/bee	negative	"Responsiveness to antennal sucrose stimulation was significantly decre
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeyb
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed
0.1-1 ng/bee	positive	"Thiamethoxam by contact induced either a significant decrease of olfac
50-6000 μg/l	positive	At concentrations >1200 $\mu g/l$ , all bees showed abnormal foraging behaviour.
100-300 g a.i./ha	positive	Mortality increased as exposure and dosage increased
15-200 g a.i./ha	positive	Mortality increased as exposure and dosage increased
48 μg/kg(ppb)	negative	But bees took significantly longer to consume sugar water
48 μg/kg(ppb)	negative	Mortality did not increase
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
0.1-1 ng/bee	negative	THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY RE
0.1-1 ng/bee	negative	
3.4 μM	borderline	partial agonist of nAChRs on AL neurones,
0.20 mg a.i./ml	positive	100% mortality
0.100 mg a.i./ml	positive	100% mortality
32 g a.i./ha	negative	not significant
32 g a.i./ha	negative	not significant
32 g a.i./ha	negative	
32 g a.i./ha	negative	
32 g a.i./ha	negative	
0.02%	positive	69% mortality at 72 hours
30ml/hl - 12 ± 0.5 hl/h	positive	foraging behavior significantly impaired
$20ml/hl - 12 \pm 0.5 hl/h$	positive	sharp decline in foraging followed by partial improvement
4g/kg seed	negative	difference not considered significant
0.2 g/litre	positive	number of returning bees greatly affected
48ug/kg	negative	no significant difference in mortality
48Ug/Kg	positive	lower tood intake in treated group
48ug/kg	positive	significantly less foraging behavior in treated group
480g/Kg	porderline	learning impaired but not significant
1.0/2,5 g a.l. /Kg seed	negative	not significant
1.25 mg a.I./seed	negative	not significant

1.25 mg a.i./seed negative not significant 1.25 mg a.i./seed negative not significant 0.5-5.0 µg/lin syrup positive significant increase in pollen carrying 0.5-5.0 µg/lin syrup positive significant difference in capped brood 6 µg/kg positive significant difference in activity that was dose and time dependent 1.00.1-10.0 µg/L positive significant mortality in all groups 1.00.1-10.0 µg/L positive mortality at all levels 45.9 g a.i./ha negative not significant  $24 \,\mu g/kg$ positive PER significantly affected 24 µg/kg positive foraging behavior significantly impaired 20-50 µg/kg positive hyperactivity - tremors - higher mortality 12 ng/bee positive significant decrease in performance 0.12-12 ng/bee positive A significant increase of CO staining 4-8 μg/L borderline some changes but not in all endpoints 100-500 ppb positive significantly less active 100-500 ppb positive effects within 1 hour vanished after 30 hours 100-1000 ppb positive 100% mortality after 24 hours at higher dosage 0.6-14 g a.i./ha positive significant foragaging impairment at higher dosages 0.6-14 g a.i./ha negative no effect 0.24 mg/seed negative hives were placed in field when flowers bloomed not when planted so seed du 0.24 mg/seed negative hive placed after bloom 0.24 mg/seed negative hive placed after bloom 0.24 mg/seed negative hive placed at bloom time 0.5-5 ppb negative not significant 110 µM positive potent inhibitors (IC50) 1-9 µM) of [3H]TCP binding to Apis head membranes, 0.1-1 ng/bee positive significant impairment of PER function 1ng/bee negative not significant 1ng/bee negative testing use of metabolite 1ng/bee negative testing use of metabolite 1ng/bee negative testing use of metabolite 10.1-10ng/bee positive significant impairment of PER function 30.6 ng/bee positive mortality significantly higher 30.6 ng/bee positive mortality significantly higher 30.6 ng/bee positive mortality significantly higher 30.6 ng/bee negative not significant 1.5-48 ug/kg negative not significant 30-240 ug/kg positive significantly lower food intake 60-240 ug/kg positive significant impairment of PER function 48 ug/kg positive significant impairment of PER function

7.5-240 ug/kg	negative	not significant
1.5-96 ug/kg	positive	significant impairment of PER function
0.0005-0.05 %	positive	100% mortality at .03%
0.0005-0.05 %	positive	70% mortality at 300 minutes at lowest dose
0.0005-0.05 %	positive	90% mortality at .05%
5 ng/bee	positive	significant loss of sensitivity
1.25-5 ng/bee	positive	significant increase in immobility and loss of coordination
1.25ng/bee	positive	significant impairment of PER function
1.25ng/bee	positive	significant staining observed
1.25-20 ng/bee	positive	significant impairment of PER function
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1-10 ng/bee	positive	significant impairment of PER function
0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
0.002-0.02 mg/kg	negative	
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
8-40ppb	positive	mortality significantly higher
4-40ppb	positive	significant impairment of PER function
50ppb	positive	flight impaired
50ppb	positive	olafactory discrimination fell by 50% but recovered
1-1000ng/bee	positive	100% mortality starting at 200ng/bee
1-1000ng/bee	positive	toxic to all worker bees
50 µg/kg	positive	number of visits declined to 0 during phase 2
25 µg/kg	positive	decrease in consumption of food
3-100 μg/kg	positive	duration of feeding declined
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant

0.75 L/ha	borderline	some changes but not in all endpoints
10-8-10-4 M	positive	increased cytochrome oxidase (CO) labelling within 30 min in all the structures
0.727 ng/bee/d	positive	mortality significantly increased with time
20 g a.i./ha	positive	100% mortality at 24 hours
20 g a.i./ha	positive	100% mortality at 2 hours
).0428-0.428 ng a.i./µ	positive	sublethal doses cause damage to brain and midgut
(5x10 -9-5x10 -7) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 -9-5x10 -7) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 -9-5x10 -7) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 -9-5x10 -7) ng a	positive	100% mortality at 150 hours
51.2 ug/m2	borderline	comparing two pesticides
51.2 ug/m2	positive	high mortality and colony strength decline
not stated	positive	acetylcholinesterase and carboxylesterase significantly decreased
1-2 ng/bee	positive	significant reduction in number of trips
1-2 ng/bee	positive	time to return significantly higher
1-2 ng/bee	positive	number returning declined signficiantly
0.7-70 μg/l	positive	highest mortality at 11 days
0.7-70 μg/l	positive	Imidacloprid had a greater effect as the acorns were much more atrophied
0.7-70 μg/kg	positive	mortality increase especially with nosema
7 μg/kg	positive	disease progressed more rapidly in treated group
140 ml/ha	negative	not significant
168 ml/ha	negative	not significant
196 ml/ha	negative	not significant
20-100 ppb	positive	mortality increased with dosage
0.005 g a.i./m2	negative	not significant
0.025-0.1 lb a.i./acre	borderline	up to 19% mortality which is more than overwintering

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143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	avoidance/food intake	oral/sugar water
143	cage	imidicloprid	behavior/foraging	field exposure/dandelion
143	cage	imidicloprid	behavior/foraging	field exposure/apple
319	cage	imidicloprid	mortality	contact/alfalfa
326	cage	imidicloprid	mortality	contact/alfalfa
601	cage	clothianidin	mortality	oral/sugar water
601	cage	imidicloprid	enzymes/aCHe activity	oral/sugar water
601	cage	imidicloprid	mortality/hyperactivity	oral/sugar water
601	cage	clothianidin	enzymes/aCHe activity	oral/sugar water
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water
1074	cage	imidicloprid	mortality	oral/pollen
1074	cage	imidicloprid	chronic food consu.	oral/pollen
1180	cage	clothianidin	mortality	field exp./potato
1708	cage	imidicloprid	mortality	oral/sugar water
1708	cage	imidicloprid	food intake	oral/sugar water
1708	cage	imidicloprid	behavior/foraging	oral/sugar water
1708	cage	imidicloprid	behavior/learning	oral/sugar water
2159	cage	imidicloprid	behavior/flight	oral/sugar water
2159	cage	imidicloprid	behavior/learning	oral/sugar water
486	desk	clothianidin	mortality	contact/dust/corn
486	desk	anidin and thiameth	mortality	contact/dust/corn
533	field	thiamethoxam	behavior/foraging	field foraging
533	field	thiamethoxam	behavior/foraging	field foraging
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
662	field	clothianidin	mortality	contact/dust
662	field	imidicloprid	mortality	contact/dust
662	field	thiamethoxam	mortality	contact/dust
680	field	thiamethoxam	behavior/flower visits	field foraging
689	field	clothianidin	colony parameters	field exposure
690	field	clothianidin	colony parameters/collapse	maize flower foraging
690	field	imidicloprid	colony parameters/collapse	maize flower foraging
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir

818	field	imidicloprid	colony parameters/collapse	l supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	l supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	l supplemental for overwir
833	field	thiamethoxam	behavior/homing rate	oral/sugar water
863	field	imidicloprid	colony parameter	oral supplements
865	field	clothianidin	mortality	contact/dust
865	field	imidicloprid	mortality	contact/dust
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/homing	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	clothianidin	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/homing rates	oral/sugar water
868	field	imidicloprid	behavior/homing	oral/sugar water
868	field	imidicloprid	behavior/foraging rate	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging/trip duration	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/feeding	oral/sugar water
895	field	combination of all	colony parameters	contact/foraging
915	field	imidicloprid	behavior/flower visits	contact/foraging
920	field	imidicloprid	colony parameter/survival	contact/foraging
978	field	clothianidin	mortality	contact/foraging
978	field	clothianidin	mortality	contact/foraging
1076	field	imidicloprid	colony parameter/collapse	unknown origin
1085	field	thiamethoxam	mortality	dust/corn
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
1164	field	imidicloprid	behavior/activity	contact/foraging
1164	field	thiamethoxam	behavior/activity	contact/foraging
1171	field	clothianidin	mortality	contact/foraging
1264	field	imidicloprid	colony parameters	contact/foraging
1277	field	imidicloprid	colony parameter/collapse	contact foraging maize
1312	field	imidicloprid	mortality	oral/sugar water
1312	field	imidicloprid	colony parameter	oral/sugar water
1312	field	imidicloprid	mortality	oral/sugar water
1312	field	imidicloprid	colony parameter	oral/sugar water
1312	field	imidicloprid	mortality	oral/sugar water
1358	field	imidicloprid	behavior/foraging	oral/sugar water
1370	field	thiamethoxam	mortality	contact/foraging
1370	field	thiamethoxam	mortality	contact/foraging
1532	field	clothianidin	colony parameter/weight	contact/foraging canola
1532	field	clothianidin	honey production	contact/foraging canola
1532	field	clothianidin	mortality	contact/foraging canola
1532	field	clothianidin	offspring production	contact/foraging canola
1532	field	clothianidin	Over-wintering	contact/foraging canola

1644	field	imidicloprid	mortality	contact/foraging
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
1760	field	imidicloprid	behavior/activity	oral/food
1760	field	imidicloprid	mortality	oral/food
1760	field	imidicloprid	colony parameter/weight gain	oral/food
1760	field	imidicloprid	behavior/pollen carrying	oral/food
1760	field	imidicloprid	brood development	oral/food
1803	field	imidicloprid	behavior/number foraging	ora/sugar water
1922	field	imidicloprid	behavior/foragaing	oral/sugar water
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1934	field	imidicloprid	y parameters/summer dev/winter su	oral/sugar water
2157	field	imidicloprid	behavior/orientation/foraging	oral/sugar water
2157	field	imidicloprid	behavior/orientation/foraging	oral/sugar water
2183	field	imidicloprid	colony parameters/weight gain	field exposure
2183	field	imidicloprid	lony parameter/number returning be	field exposure
2183	field	imidicloprid	colony parameters/pollen carrying	field exposure
2183	field	imidicloprid	colony parameters/visits to flowers	field exposure
2183	field	imidicloprid	pollination/fruit set	field exposure
2183	field	imidicloprid	colony parameter/colony weight	field exposure
2183	field	imidicloprid	colony parameter/colony growth	field exposure
2183	field	imidicloprid	colony parameter/brood nest size	field exposure
2183	field	imidicloprid	colony parameter/comb size	field exposure
2183	field	imidicloprid	lony parameter/number returning be	field exposure
2183	field	imidicloprid	colony parameter/pollen carrying	field exposure
7352	field	thiamethoxam	behavior/foraging	oral/sugar water
7352	field	thiamethoxam	behavior/returning bees	oral/sugar water
7352	field	thiamethoxam	Behavior/returning bees	oral/sugar water
7467	field	imidicloprid	behavior/foraging	contact/brassica
7467	field	imidicloprid	behavior/foraging	contact/brassica
7467	field	imidicloprid	behavior/foraging	contact/brassica
7532	field	imidicloprid	behavior/foraging	oral/sugar water
1186	greenhouse	clothianidin	mortality	contact
1259	greenhouse	thiamethoxam	mortality	contact/oral/dust
0	lab	clothianidin	behavior/arching and wing block	oral.guttation fluid
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid
0	lab	imidicloprid	behavior/arching and wing block	oral.guttation fluid
0	lab	clothianidin	behavior/arching and wing block	oral.guttation fluid
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid

165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
397	lab	imidicloprid	binding to acetylcholine receptor	
500	lab	thiamethoxam	organ damage	oral/syrup
504	lab	imidicloprid	mortality	oral/sugar water
504	lab	imidicloprid	molecular response/gene expression	oral/sugar water
505	lab	imidicloprid	behavior/homing	oral/sugar water
505	lab	clothianidin	behavior/homing	oral/sugar water
521	lab	imidicloprid	behavior/feeding	oral/syrup
529	lab	imidicloprid	morphology/apoptosis nerve cells	oral
533	lab	thiamethoxam	behavior/foraging	oral
534	lab	imidicloprid	behavior/coordination	oral
535	lab	imidicloprid	behavior/reflex	assumed oral
545	lab	thiamethoxam	mortality	contact/leaves
545	lab	thiamethoxam	mortality	contact/spray
545	lab	thiamethoxam	mortality	oral/sugar water
557	lab	clothianidin	immunity/immune response	contact/topical
557	lab	clothianidin	immunity/immune response	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water
557	lab	imidicloprid	immunity/deformed wing virus	oral/sugar water
580	lab	imidicloprid	behavior/learning	oral/honey
603	lab	imidicloprid	brain morphology	oral/sugar water
612	lab	imidicloprid	logy/Development of hypopharyngea	oral/pollen/sugar water
612	lab	imidicloprid	electrophysiology	oral/pollen/sugar water
616	lab	imidicloprid	behavior/avoidance	contact/oral/dust
622	lab	imidicloprid	behavior/reflex	oral/sugar water
622	lab La la	mix - imidicloprid		oral/sugar water
635	lab	imidicloprid	mortality	oral/sugar water
635	lab	mix - imidicloprid	mortality	oral/sugar water
635	lab	imidicloprid	behavior/reflex	oral/sugar water

635	lab	mix - imidicloprid	behavio/reflex	0
654	lab	imidicloprid	acetylcholinesterase activity/brain	
654	lab	imidicloprid	acetylcholinesterase activity/brain	
697	lab	imidicloprid	mortality	
697	lab	imidicloprid	mortality	
697	lab	imidicloprid	mortality	
744	lab	imidicloprid	feeding rate	0
744	lab	imidicloprid	survival/longevity	0
750	lab	clothianidin	mortality	
750	lab	clothianidin	mortality	
753	lab	imidicloprid	capped brood rate	in
753	lab	imidicloprid	pupation rate	in
753	lab	imidicloprid	eclosion rate	in
753	lab	imidicloprid	behavior/probosis extenion/PER	in
758	lab	imidicloprid	mortality	
758	lab	imidicloprid	mortality	
783	lab	imidicloprid	genetic change/larval gene expression	
788	lab	thiamethoxam	sublethal/biomarkers	
820	lab	imidicloprid	behavior/distance travelled	0
820	lab	imidicloprid	behavior/interaction	0
820	lab	imidicloprid	behavior/time in food zone	0
823	lab	imidicloprid	behavior/foraging and waggle dance	
823	lab	imidicloprid	behavior/PEReflex	
859	lab	imidicloprid	mortality	(
935	lab	imidicloprid	mortality	0
984	lab	imidicloprid	behavior/reflex/PER	0
984	lab	imidicloprid	behavior/reflex	0
1005	lab	imidicloprid	development/cell death	C
1023	lab	imidicloprid	morphology/acini diameter	0
1075	lab	imidicloprid	behavior/navigation	
1075	lab	imidicloprid	behavior/PEReflex	
1107	lab	imidicloprid	genetic/change	0
1118	lab	imidicloprid	ethyl oleate production	0
1133	lab	imidicloprid	mortality	0
1133	lab	imidicloprid	immunity/Total haemolymph count	0
1146	lab	thiamethoxam	mortality	oral
1146	lab	thiamethoxam	mortality	oral
1146	lab	thiamethoxam	mortality	oral
1146	lab	thiamethoxam	mortality	oral
1146	lab	thiamethoxam	mortality	oral
1153	lab	imidicloprid	mortality/neurotoxicy	
1213	lab	imidicloprid	mortality	COI
1236	lab	thiamethoxam	behavior/arching and wing block	ora
1265	lab	imidicloprid	mortality	
1265	lab	imidicloprid	mortality	
1265	lab	imidicloprid	mortality	
1265	lab	imidicloprid	mortality	

oral/sugar water not stated not stated film method film method film method oral/sugar water oral/sugar water contact/leaves contact/leaves to laraval combs to laraval combs to laraval combs to laraval combs oral/food oral/food oral formula contact oral/sugar water oral/sugar water ral/sugar water oral oral contact/topical oral/sugar water oral/sugar water oral/sugar water oral/larval food oral/sugar water oral/pollen oral/pollen oral/sugar water oral/sugar water oral/sugar water oral/sugar water /honey insecticide /honey insecticide /honey insecticide /honey insecticide /honey insecticide oral/food ntact/filter paper al/guttation fluid all routes all routes all routes all routes

1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1306	lab	thiamethoxam	mortality	spray
1306	lab	thiamethoxam	mortality	contaminated diet
1306	lab	thiamethoxam	mortality	intact/contaminated surfa
1306	lab	thiamethoxam	mortality	contact/leaves
1314	lab	thiamethoxam	mortality	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	contact/topical
1314	lab	thiamethoxam	chronic/probiscus extension	contact/topical
1314	lab	thiamethoxam	locomotor	contact/topical
1314	lab	thiamethoxam	sugar respons3	contact/topical
1314	lab	thiamethoxam	learning	contact/topical
1400	lab	imidicloprid	behavior/foraging	oral/sugar water
1400	lab	imidicloprid	mortality	oral/sugar water
1408	lab	thiamethoxam	behavior/locomotion	oral/sugar water
1408	lab	thiamethoxam	behavior/PEReflex	contact/topical
1408	lab	thiamethoxam	behavior/locomotion/learning	oral/topical
1408	lab	thiamethoxam	behavior/reflex	topical contact
1419	lab	imidicloprid	electrophysiology	direct to antenae
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	clothianidin	mortality	contact corn tassels
1802	lab	mix imidicloprid	mortality	oral/sugar water
1802	lab	mix imidicloprid	mortality	oral/sugar water
1836	lab	imidicloprid	behavior/reflex	oral/sugar water
1839	lab	imidicloprid	behavior/symptoms	oral/sugar water
1845	lab	imidicloprid	behavior/PER	oral/sugar water
1845	lab	imidicloprid	histochemestry	oral/sugar water
1888	lab	imidicloprid	effects of long term exposure	oral/sugar water
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
1943	lab	imidicloprid	imidicloprid binding site	head membranes
1949	lab	imidicloprid	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water

1954	lab	imidicloprid	mortality	or
1954	lab	imidicloprid	mortality	or
1954	lab	imidicloprid	mortality	or
1954	lab	imidicloprid	mortality	or
1954	lab	imidicloprid	sublethal/food intake	or
1954	lab	imidicloprid	sublethal/food intake	or
1954	lab	imidicloprid	behavior/PER	or
1954	lab	imidicloprid	behavior/PER	or
1954	lab	metabolite of im.	behavior/PER	or
1954	lab	imidicloprid	behavior/PER	or
1970	lab	imidicloprid	mortality	(
1970	lab	imidicloprid	mortality	(
1970	lab	imidicloprid	mortality	(
2060	lab	imidicloprid	behavior/gustatory threshold	С
2060	lab	imidicloprid	behavior/locomotion	С
2060	lab	imidicloprid	behavior/PER	С
2060	lab	imidicloprid	histochemestry	cr
2095	lab	imidicloprid	behavior/PER	or
2096	lab	imidicloprid	mortality	or
2096	lab	metabolite of im.	mortality	or
2096	lab	metabolite of im.	mortality	or
2096	lab	metabolite of im.	mortality	or
2096	lab	metabolite of im.	mortality	or
2096	lab	metabolite of im.	mortality	or
2096	lab	metabolite of im.	mortality	or
2112	lab	imidicloprid	behavior/PER	С
2159	lab	imidicloprid	mortality	
2159	lab	imidicloprid	behavior/PER	
2160	lab	imidicloprid	mortality	or
2160	lab	imidicloprid	mortality	or
2207	lab	imidicloprid	/Densitometric analysis for AL and mu	d
7242	lab	thiamethoxam	mortality	or
7260	lab	imidicloprid	mortality	
7260	lab	clothianidin	mortality	
7274	lab	thiamethoxam	Morphology/histochemistry/	or
7302	lab	thiamethoxam	mortality	or
7302	lab	thiamethoxam	mortality	or
7302	lab	thiamethoxam	mortality	or
7302	lab	thiamethoxam	mortality	or
7346	lab	thiamethoxam	Enzymes/AChE activity	cont
7390	lab	imidicloprid	mortality	or
7390	lab	imidicloprid	logy/Development of hypopharyngea	or
7391	lab	imidicloprid	mortality	or
7391	lab	imidicloprid	sub-lethal/disease status	or
750	semi-field	clothianidin	mortality	
750	semi-field	clothianidin	colony parameter/strength	
750	semi-field	clothianidin	colony parameter/thermoregulation	

al/sugar water oral/solution oral/solution oral/solution ontact/topical ontact/topical ontact/topical ranial injection al/sugar water ontact/topical oral/diet oral/diet al/sugar water al/sugar water lirect to brain al/sugar water contact/film contact/film al/sugar water al/sugar water al/sugar water al/sugar water al/sugar water tact/acetone sol. al/sugar water al/sugar water al/sugar water al/sugar water contact contact contact

750	semi-field	clothianidin	colony parameter/behavior	contact
750	semi-field	clothianidin	colony parameter/flight	contact
884	semi-field	clothianidin	mortality	contact
1011	semi-field	clothianidin	mortality	contact/oral/dust
1011	semi-field	clothianidin	behavior	contact/oral/dust
1801	semi-field	imidicloprid	behavior/foraging	oral/sugar water
1836	semi-field	imidicloprid	behavior/learning	oral/sugar water
1923	semi-field	imidicloprid	behavior/foraging	contact and oral
1923	semi-field	imidicloprid	mortality	contact and oral
2139	semi-field	imidicloprid	behavior/foraging	oral/food/honey
2139	semi-field	imidicloprid	honey production	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/weight gain	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/offspring	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	mortality	oral/food/honey
7303	semi-field	clothianidin	mortality	talc/contact
7303	semi-field	clothianidin	colony parameter/strength	talc/contact
7556	semi-field	imidicloprid	mortality	contact/leaves alfalfa
7533	tent		colony parameters/varied	field exposure
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
2162	Tunnel	imidicloprid	ony parameters/visits to feeding static	oral/sugar water
2162	Tunnel	imidicloprid	colony parameters/food intake	oral/sugar water
2162	Tunnel	imidicloprid	colony parameters/feeding duration	oral/sugar water

.028-.28kg a.i./ha positive 97% mortality with 2 hours aged residue .028-.28kg a.i./ha positive 100% mortality with 8 hours aged residue .028-.28kg a.i./ha positive 100% mortality with 8 hours aged residue .028-.28kg a.i./ha positive 100% mortality with 8 hours aged residue 10 ppm positive 85% fewer feeding visits 0.112 kg(a.i.)/ ha positive 60% reduction in foraging 0.112 kg(a.i.)/ ha negative no significant difference .168kg a.i./ha positive increased from 14% to 19% in 2 hours .11kg a.i./ha positive 33% mortality at 2 hours .03-.25ng/bee negative abstract says positive for other markers .03-.25ng/bee positive AchE activity much higher 0.24-0.30 ng/bee positive hyperactivity - tremors - higher mortality 0.12-0.24 ng/bee positive AchE activity much higher .03-.25ng/bee negative no significant difference in mortality 48ng/g negative 20% mortality compared to 15% 48ng/g positive consumption of treated pollen significantly less general exp. positive mortality increased over time 48ug/kg negative no significant difference in mortality 48ug/kg positive lower food intake in treated group 48ug/kg positive significantly less foraging behavior in treated group 48ug/kg borderline learning impaired but not significant 50ppb positive flight impaired 50ppb positive olafactory discrimination fell by 50% but recovered field exposure positive High mortality reported in 2012 field exposure positive High mortality reported in 2012 1/10 LD50 positive significant reduction of motor coordination 1/50 LD50 positive return rate significantly lowered 12.6 g a.i./ha negative not significant 88.2 g a.i./ha negative not significant 1.25 mg/seed positive 100% mortality with brief dusting 0.1 mg/seed positive 0.1 mg/seed positive 87% mortality with brief dusting ; insecticide/20L of wa positive 65% mortality with brief dusting )L, 5000x diluted -at 2 negative "The results indicated that clothianidin spraying of the rice field increased the 156 mL per 50,000 negative study reported that there were other plants in the area that are favored over t /150 mL per 50,000 si negative study reported that there were other plants in the area that are favored over t  $0 \mu g/kg$ control 1 of 4 colonies collapsed at 23 weeks 1 (4wk)/20 (9wk) µg/l positive 3 of 4 colonies collapsed at 19-23 weeks

1 (4wk)/ 40 (9wk) μg/	positive	4 of 4 colonies collapsed starting at 16 weeks
3 (4wk)/ 200 (9wk) μg,	positive	All colonies failed
5 (4wk)/ 400 (9wk) µg	positive	All colonies failed between 14 and 18 weeks
1.34 ng/bee	positive	significant reduction in homing up to 31% failed to return to hive when hive rea
5-20 ppb	positive	difficulty when exposed to other toxins as compared to controls
118-674 ng/bee	positive	100% mortality in high humidity starting at 20 minutes to 8 hours
30-3661 ng/bee	positive	100% mortality in high humidity
0.15-6ng/bee	positive	number of feeder visits decreased by up to 98%
0.15-6ng/bee	positive	at 3ng, reduced mobility observed
0.15-6ng/bee	positive	trip duration increased by 50% to 130%
0.15-6ng/bee	positive	time spent at feeder increased up to 47%
0.15-6ng/bee	positive	flight time to feeder increased up to 241%
0.15-6ng/bee	positive	flight time to hive increased up to 210%
0.15-6ng/bee	positive	intervals between feedings increased by 33% up to 993% respectively
0.15-6ng/bee	positive	80% fewer bees returned. Demonstrated distended bellies, legs shaking, death
0.5-2 ng/bee	positive	feeder visits reduced significantly
0.5-2 ng/bee	positive	duration of trips significantly affected
0.5-2 ng/bee	positive	time spent at feeder increased by up to 100%
0.5-2 ng/bee	positive	duration of trips significantly affected
1.5-3 ng/bee	positive	intervals between flights significantly increased
1.5-3 ng/bee	positive	time in hive increased
varied	negative	"However, the risk exposure of bee colonies on adverse impact
0.02%	positive	number of visits to flowers reduced
dust	positive	higher mortality, higher queen mortality and lower hive weight
1.25 mg/seed dust	negative	"Chemical analysis showed high quantities of neonicotinoid insecticide in dead
g/seed dust 30 min. e	positive	50-97% mortality
27 (14-39) ng/g	positive	colonies contaminated by unknown source of neonics.
7.35 g a.i./ha20%	positive	mortality significantly higher
7.35 g a.i./ha50%	positive	foraging behavior significantly impaired
0.004-0.008 % a.i.	positive	Activity less with exposure
0.004-0.008 % a.i.	positive	Activity less with exposure
(1.8) (ng/bee)	positive	mortality significantly higher
varied	negative	not significant
dust	negative	"However, additional studies are needed
3.55 ng a.i./L	negative	neurotocity determined
3.55 ng a.i./L	negative	"Our observations point towards decays of overall colony vitality
3.55 ng a.i./L	negative	
3.55 ng a.i./L	negative	
3.55 ng a.i./L	negative	study abstract says positive for all but one endpoint
50-6000 μg/l	positive	At concentrations >1200 $\mu$ g/l, all bees showed abnormal foraging behaviour.
100-300 g a.i./ha	positive	Mortality increased as exposure and dosage increased
15-200 g a.i./ha	positive	Mortality increased as exposure and dosage increased
32 g a.i./ha	negative	not significant
32 g a.i./ha	negative	not significant
32 g a.i./ha	negative	
32 g a.i./ha	negative	
32 g a.i./ha	negative	

0.02%	positive	69% mortality at 72 hours
4g/kg seed	negative	difference not considered significant
0.2 g/litre	positive	number of returning bees greatly affected
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	positive	significant increase in pollen carrying
0.5-5.0 μg/lin syrup	positive	significant difference in capped brood
45.9 g a.i./ha	negative	not significant
100-1000 ppb	positive	100% mortality after 24 hours at higher dosage
0.24 mg/seed	negative	hives were placed in field when flowers bloomed not when planted so seed du
0.24 mg/seed	negative	hive placed after bloom
0.24 mg/seed	negative	hive placed after bloom
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.5-5 ppb	negative	not significant
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	borderline	some changes but not in all endpoints
1-2 ng/bee	positive	significant reduction in number of trips
1-2 ng/bee	positive	time to return significantly higher
1-2 ng/bee	positive	number returning declined signficiantly
140 ml/ha	negative	not significant
168 ml/ha	negative	not significant
196 ml/ha	negative	not significant
20-100 ppb	positive	mortality increased with dosage
unknown	positive	averaged 123 dead bees per colony at day 1
200 g/ha	positive	100% mortality after 330 minutes
23.3 mg/L	positive	wing block within 2 to 9 minutes
23.3 mg/L	positive	more toxic than clothianidin
6.25-100 mg/L	positive	wing block within 2 to 9 minutes
23.3 mg/L	positive	dose dependent
1.5-100 mg/L	positive	wing block within 1 hour

25.0 g a.i./ha	positive	100% mortality over two seasons
25.0 g a.i./ha	positive	87% mortality with shorter administration
25.0 g a.i./ha	positive	100% mortality over two seasons
25.0 g a.i./ha	positive	67% mortality with shorter administration
25.0 g a.i./ha	positive	57% mortality with shorter administration
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	negative	low mortality if bees exposed 3 days later
2.53 μM (Ki)	positive	Strong binding
0.0428 ng a.i./L diet	positive	sub-lethal doses cause organ damage while metabolizing the pesticide. Dama
2 µg/L	positive	70% increase in mortality in those with parasites
2 μg/L	positive	affected immune related genes
7.5-11.25 ng/bee	positive	unable to reach the hive
2.5 ng/bee	positive	longer flight paths
125 μg/L	negative	not significant
9.9ng/bee	positive	apoptosis of nerve cells confirmed and increased with dosage
1/5 of LD50	positive	could not discriminate between food and non food sources
1/100 of LD50	positive	loss of coordination
1/5 of LD50	positive	impaired sucrose metabolism
0.00583 ml/cm2	positive	100% mortality after 2.61 hours
0.00583 ml/cm2	positive	100% mortality after 1 hour
0.00583 ml/cm2	positive	100% mortality after 1.51 hours
21ng/bee	positive	supressed immune response
21ng/bee	positive	agonist of acetylcholine receptor disrupts immune response
10-30ng/bee	positive	virus replicated faster/dose dependent
10-30ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1ug/bee	positive	learning and memory significantly impaired
0.809-8.09 ng/bee	positive	apoptosis of brain cells confirmed
2.1 (sugar water)	positive	hypopharyngeal glands significantly smaller
2.1 (sugar water)	negative	not significant
1.28 ng/bee	negative	not significant
1.8ng/bee	negative	not significant
1.8ng/bee	negative	not significant
1000 nmol/l	positive	mortality significantly higher
1000 nmol/l	positive	mortality significantly higher
1000 nmol/l	positive	significant impairment of all functions
1000 nmol/l	positive	significant impairment of all functions
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295 nM	positive	inhibited ACHe response
200 nM	positive	inhibited ACHe response
0.25 ml/L	positive	mortality 4 times higher
0.50 ml/L	positive	mortality 4 times higher
0.75 ml/L	positive	mortality 4 times higher
0.08-125 ug/L	negative	no difference
0.08-125 ug/L	negative	no difference
5.12 ug/m2	positive	mortality increased over time
5.12 ug/m2 x 3 hours	positive	mortality increased over time
24 ng/larava	positive	signficantly different than control. Most removed by nurse bees
24 ng/larava	positive	pupation rates significantly affected
2000 ng/larava	positive	eclosion rates significantly affected from 2000 up
0.04 ng/larva	positive	significant olfactory impairment dose dependent
68ppb	negative	Formula was adjusted by Abbott and then retested providing stated results
96ppb	positive	Formula was adjusted by Abbot
200ppm	negative	significantly more dead than controls
2.56-51.16	positive	but there were changes in gene expression
50-500 ppb	borderline	difference not considered significant
50-500 ppb	positive	lower dose no effect/ higher dose strong effect
50-500 ppb	positive	less interaction dose dependent
24 ppb	positive	no difference in foragaging but significant difference in dance
24-241 ppb	positive	Fewer PER responses that were further reduced by dose increase
0.005-0.03 μg/bee	borderline	imidicloprid toxicity not affected by diet
50 ng/µl 1mM verapaı	borderline	significantly higher mortality
0.3-0.6 ng/bee	positive	PER significantly affected
0.3-0.6 ng/bee	negative	not significant
400 ppm	positive	high rate of apoptosis
1 ppb	positive	acini declined by dose
48ppb	positive	navigation significantly impaired
48ppb	positive	not significant
10mg.l	positive	The AccGtpx-1 gene was induced after treatments with imidacloprid
7 μg/kg	negative	not significant
0.7-70 μg/l	positive	Highest mortality in bees infected with Nosema
0.7-70 μg/l	negative	not significant
x10-6-1.5x10-3 m/ml	positive	especially high mortality in bees with virus
x10-6-1.5x10-3 m/ml	positive	highest mortality in younger bees
x10-6-1.5x10-3 m/ml	positive	90% mortality
x10-6-1.5x10-3 m/ml	positive	younger bees regurgitated but were damaged
x10-6-1.5x10-3 m/ml	negative	In Malpighian tubules treated with insecticide a smaller basophilic was observe
500 ng/kg	positive	Decrease in HPG acinal diameter with exposure duration.
25 g a.i./ha	positive	50% mortality in 24 hours
47 mg/L	positive	wing block within 2 to 6 minutes
25.0 g a.i./ha	positive	100%mortality at 0 hours aged residue
25.0 g a.i./ha	positive	87% mortality over two seasons for 1 hour residue
25.0 g a.i./ha	positive	74% mortality for 4 hour residue
25.0 g a.i./ha	positive	64% mortality for 8 hour residue

25.0 g a.i./ha	positive	41% mortality for 24 hour aged residues
25.0 g a.i./ha	positive	22% mortality for 48 hour aged residues
25.0 g a.i./ha	positive	15% mortality for 72 hour aged residues
25.0 g a.i./ha	positive	7.5% mortality for 120 hour aged residues
150 g/100L H2O	positive	71% mortality after 1 hour, 100% mortality after 9 hours
150 g/100L H2O	positive	99% mortality at 24 hours
150 g/100L H2O	positive	56% mortality 1 hour after contact
150 g/100L H2O	positive	100% mortality at 9 hours
0.1-1 ng/bee	negative	
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed
0.1-1 ng/bee	negative	"Thiamethoxam by contact induced either a significant decrease of olfac
0.1-1 ng/bee	negative	"Responsiveness to antennal sucrose stimulation was significantly decre
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeyb
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed
0.1-1 ng/bee	positive	"Thiamethoxam by contact induced either a significant decrease of olfac
48 μg/kg(ppb)	negative	But bees took significantly longer to consume sugar water
48 μg/kg(ppb)	negative	Mortality did not increase
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
0.1-1 ng/bee	negative	THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY RE
0.1-1 ng/bee	negative	
3.4 μM	borderline	partial agonist of nAChRs on AL neurones,
0.20 mg a.i./ml	positive	100% mortality
0.100 mg a.i./ml	positive	100% mortality
1.6/2,5 g a.i. /kg seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
1.00.1-10.0 μg/L	positive	significant mortality in all groups
1.00.1-10.0 μg/L	positive	mortality at all levels
24 μg/kg	positive	PER significantly affected
20-50 µg/kg	positive	hyperactivity - tremors - higher mortality
12 ng/bee	positive	significant decrease in performance
0.12-12 ng/bee	positive	A significant increase of CO staining
4-8 μg/L	borderline	some changes but not in all endpoints
100-500 ppb	positive	significantly less active
100-500 ppb	positive	effects within 1 hour vanished after 30 hours
110 μM	positive	potent inhibitors (IC50) 1-9 $\mu$ M) of [3H]TCP binding to Apis head membranes,
0.1-1 ng/bee	positive	significant impairment of PER function
1ng/bee	negative	not significant
ing/bee	negative	testing use of metabolite
ing/bee	negative	testing use of metabolite
Ing/bee	negative	testing use of metabolite
10.1-10ng/bee	positive	significant impairment of PER function

30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	negative	not significant
1.5-48 ug/kg	negative	not significant
30-240 ug/kg	positive	significantly lower food intake
60-240 ug/kg	positive	significant impairment of PER function
48 ug/kg	positive	significant impairment of PER function
7.5-240 ug/kg	negative	not significant
1.5-96 ug/kg	positive	significant impairment of PER function
0.0005-0.05 %	positive	100% mortality at .03%
0.0005-0.05 %	positive	70% mortality at 300 minutes at lowest dose
0.0005-0.05 %	positive	90% mortality at .05%
5 ng/bee	positive	significant loss of sensitivity
1.25-5 ng/bee	positive	significant increase in immobility and loss of coordination
1.25ng/bee	positive	significant impairment of PER function
1.25ng/bee	positive	significant staining observed
1.25-20 ng/bee	positive	significant impairment of PER function
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1-10 ng/bee	positive	significant impairment of PER function
8-40ppb	positive	mortality significantly higher
4-40ppb	positive	significant impairment of PER function
1-1000ng/bee	positive	100% mortality starting at 200ng/bee
1-1000ng/bee	positive	toxic to all worker bees
10-8-10-4 M	positive	increased cytochrome oxidase (CO) labelling within 30 min in all the structures
0.727 ng/bee/d	positive	mortality significantly increased with time
20 g a.i./ha	positive	100% mortality at 24 hours
20 g a.i./ha	positive	100% mortality at 2 hours
).0428-0.428 ng a.i./µ	positive	sublethal doses cause damage to brain and midgut
(5x10 -9-5x10 -7) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 -9-5x10 -7) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 -9-5x10 -7) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 -9-5x10 -7) ng a	positive	100% mortality at 150 hours
not stated	positive	acetylcholinesterase and carboxylesterase significantly decreased
0.7-70 μg/l	positive	highest mortality at 11 days
0.7-70 μg/l	positive	Imidacloprid had a greater effect as the acorns were much more atrophied
0.7-70 μg/kg	positive	mortality increase especially with nosema
7 μg/kg	positive	disease progressed more rapidly in treated group
5.12 ug/m2	positive	mortality increased over time
5.12 ug/m2	positive	colony strength affected
5.12 ug/m2	negative	no change in thermoregulation

negative	no significant change
positive	flight activity higher in treated group
positive	mortality significantly higher
positive	mortality increased with dosage
positive	risk greatest at edge of field
positive	significant difference in activity that was dose and time dependent
positive	foraging behavior significantly impaired
positive	significant foragaging impairment at higher dosages
negative	no effect
negative	Bayer Agriculture Center Study
borderline	comparing two pesticides
positive	high mortality and colony strength decline
borderline	up to 19% mortality which is more than overwintering
negative	not significant
positive	foraging behavior significantly impaired
positive	sharp decline in foraging followed by partial improvement
positive	number of visits declined to 0 during phase 2
positive	decrease in consumption of food
positive	duration of feeding declined
	negative positive positive positive positive positive positive negative negative negative negative negative negative negative negative negative positive borderline positive positive positive positive positive

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res analyse

0	lab	clothianidin	behavior/arching and wing block	oral.guttation fluid	23.3 mg/L	positive	wing block within 2 to 9 minutes
0	lab	clothianidin	behavior/arching and wing block	oral.guttation fluid	23.3 mg/L	positive	dose dependent
486	desk	clothianidin	mortality	contact/dust/corn	field exposure	positive	High mortality reported in 2012
505	lab	clothianidin	behavior/homing	oral/sugar water	2.5 ng/bee	positive	longer flight paths
557	lab	clothianidin	immunity/immune response	contact/topical	21ng/bee	positive	supressed immune response
557	lab	clothianidin	immunity/immune response	contact/topical	21ng/bee	positive	agonist of acetylcholine receptor disrupts immun
557	lab	clothianidin	immunity/deformed wing virus	contact/topical	10-30ng/bee	positive	virus replicated faster/dose dependent
557	lab	clothianidin	immunity/deformed wing virus	contact/topical	0.02-2 ng/bee	positive	virus replicated faster/dose dependent
557	lab	clothianidin	immunity/deformed wing virus	contact/topical	0.1-10 ppb	positive	virus replicated faster/dose dependent
557	lab	clothianidin	immunity/deformed wing virus	contact/topical	0.02-2 ng/bee	positive	virus replicated faster/dose dependent
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water	0.1-10 ppb	positive	virus replicated faster/dose dependent
601	cage	clothianidin	mortality	oral/sugar water	.0325ng/bee	negative	abstract says positive for other markers
601	cage	clothianidin	enzymes/aCHe activity	oral/sugar water	0.12-0.24 ng/bee	positive	AchE activity much higher
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water	.0325ng/bee	negative	no significant difference in mortality
662	field	clothianidin	mortality	contact/dust	1.25 mg/seed	positive	100% mortality with brief dusting
689	field	clothianidin	colony parameters	field exposure	50L. 5000x diluted -at 20	negative	"The results indicated that clothianidin spraving c
690	field	clothianidin	colony parameters/collapse	maize flower foraging	156 mL per 50.000	negative	study reported that there were other plants in the
750	lab	clothianidin	mortality	contact/leaves	5.12 µg/m2	positive	mortality increased over time
750	lab	clothianidin	mortality	contact/leaves	$5.12 \text{ ug/m}^2 \times 3 \text{ hours}$	nositive	mortality increased over time
750	semi-field	clothianidin	mortality	contact	5 12 ug/m2	nositive	mortality increased over time
750	semi-field	clothianidin	colony parameter/strength	contact	5 12 ug/m2	nositive	colony strength affected
750	semi-field	clothianidin	colony parameter/thermoregulation	contact	5 12 ug/m2	negative	no change in thermoregulation
750	semi-field	clothianidin	colony parameter/hehavior	contact	5 12 ug/m2	negative	no significant change
750	semi-field	clothianidin	colony parameter/flight	contact	5 12 ug/m2	nositive	flight activity higher in treated group
865	field	clothianidin	mortality	contact/dust	118-674 ng/hee	positive	100% mortality in high humidity starting at 20 mi
868	field	clothianidin	hebayior/foraging	oral/sugar water	0.15-6ng/bee	positive	flight time to hive increased up to 210%
884	semi-field	clothianidin	mortality	contact	1  g a i /ba (x < 160  µm)	positive	mortality significantly higher
079	field	clothianidin	mortality	contact/foraging	1 25 mg/seed dust	positive	"Chamical analysis showed high quantities of nee
978	field	clothianidin	mortality	contact/foraging	ng/seed dust 30 min_ev	nositive	50-97% mortality
1011	semi-field	clothianidin	mortality	contact/oral/dust	0.5-2 g a i /ba	positive	mortality increased with desage
1011	semi-field	clothianidin	hebavior	contact/oral/dust	0.5-2 g a.i./ha	positive	risk greatest at edge of field
1171	field	clothianidin	mortality	contact/foraging	(1.8) (ng/bee)	positive	mortality significantly higher
1100	neiu	clothianidin	mortality	field ovn /notato		positive	mortality increased over time
1186	greenbouse	clothianidin	mortality	contact		positive	averaged 122 dead bees per colony at day 1
1522	field	clothianidin	colony parameter (woight	contact/foraging canola		positive	not significant
1532	field	clothianidin	bonov production	contact/foraging canola	32  g a.i./lid	negative	not significant
1522	field	clothianidin	mortality	contact/foraging canola	32  g a.i./lid	negative	
1552	field	clothianidin	offenring production	contact/foraging canola	32  g a.i./lid	negative	
1532	field	clothianidin	Over wintering	contact/foraging canola	32  g a.i./lid	negative	
1700	lab	clothianidin	mortality		52 g d.1./11d	negative	not cignificant
7760	lab	clothianidin	mortality	contact contrassels	20 g a i /ba	negative	100% mortality at 2 hours
7200	iau comi fiold	clothianidin	mortality	tals/contact	20  g d.1./11d	bordorlino	somparing two posticides
7505	semi-field	clothianidin	montality	talc/contact	$51.2 \text{ ug/m}^2$	positivo	bigh mortality and colony strength decline
1505	Seriii-iieiu	ciocinamicini ionidin and thiomoth	coloriy parameter/strength		51.2 ug/112	positive	High mortality and colony strength decline
400 905	field		colony parameters	contact/dust/com	neid exposure	positive	"However, the risk expective of her colonics
095	leh	imidiclonrid	colony parameters	contact/foraging		negative	However, the fisk exposure of bee colonies
0	as	imidicioprid	behavior/arching and wing block	oral.guttation fluid	6.25-100 mg/L	positive	wing block within 2 to 9 minutes
143	cage	imidicioprid	mortality		.02828kg a.l./ha	positive	97% mortality with 2 hours aged residue
143	cage	imidicioprid	mortality		.02828kg a.l./ha	positive	100% mortality with 8 hours aged residue
143	cage	imidicioprid	mortality	contact/alfalfa	.02828kg a.l./ha	positive	100% mortality with 8 hours aged residue
143	cage	imidicioprid	mortality	contact/alfalfa	.02828Kg a.I./ha	positive	100% mortality with 8 hours aged residue
143	cage	imidicioprid	avoidance/food intake	orai/sugar water		positive	85% fewer feeding visits
143	cage	imidicloprid	benavior/foraging	Tield exposure/dandelion	0.112 kg(a.i.)/ ha	positive	60% reduction in foraging
143	cage	imidicloprid	benavior/foraging	tield exposure/apple	0.112 kg(a.i.)/ ha	negative	no significant difference
165	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	100% mortality over two seasons
165	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	87% mortality with shorter administration

ne response

of the rice field increased the mortality he area that are favored over the maize

ninutes to 8 hours

onicotinoid insecticide in dead bees

s on adverse impact

165	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	100% mortality over two seasons
165	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	67% mortality with shorter administration
165	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	57% mortality with shorter administration
165	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	mortality declined when bees were exposed later
165	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	mortality declined when bees were exposed later
165	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	mortality declined when bees were exposed later
165	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	mortality declined when bees were exposed later
165	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	mortality declined when bees were exposed later
165	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	negative	low mortality if bees exposed 3 days later
319	cage	imidicloprid	mortality	contact/alfalfa	.168kg a.i./ha	positive	increased from 14% to 19% in 2 hours
326	cage	imidicloprid	mortality	contact/alfalfa	.11kg a.i./ha	positive	33% mortality at 2 hours
397	lab	imidicloprid	binding to acetylcholine receptor		2.53 μM (Ki)	positive	Strong binding
504	lab	imidicloprid	mortality	oral/sugar water	2 µg/L	positive	70% increase in mortality in those with parasites
504	lab	imidicloprid	molecular response/gene expression	oral/sugar water	2 µg/L	positive	affected immune related genes
505	lab	imidicloprid	behavior/homing	oral/sugar water	7.5-11.25 ng/bee	positive	unable to reach the hive
521	lab	imidicloprid	behavior/feeding	oral/svrup	125 µg/L	negative	not significant
529	lab	imidicloprid	morphology/apoptosis nerve cells	oral	9.9ng/bee	positive	apoptosis of nerve cells confirmed and increased w
534	lab	imidicloprid	behavior/coordination	oral	1/100 of LD50	positive	loss of coordination
535	lab	imidicloprid	behavior/reflex	assumed oral	1/5 of LD50	positive	impaired sucrose metabolism
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical	10-30ng/bee	positive	virus replicated faster/dose dependent
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical	0.02-2 ng/bee	nositive	virus replicated faster/dose dependent
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical	0 1-10 pph	nositive	virus replicated faster/dose dependent
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical	0.02-2 ng/bee	nositive	virus replicated faster/dose dependent
557	lab	imidicloprid	immunity/deformed wing virus	oral/sugar water	0.1-10 nnh	nositive	virus replicated faster/dose dependent
580	lab	imidicloprid	hebayior/learning	oral/honey	0.1 10 ppb	nositive	learning and memory significantly impaired
601	200	imidicloprid	enzymes/aCHe activity	oral/sugar water	0.10g/bee	positive	AchE activity much higher
601	cage	imidicloprid	mortality/hyperactivity	oral/sugar water	0.24-0.30 ng/bee	positive	hyperactivity - tremors - higher mortality
603	lab	imidicloprid	hrain morphology	oral/sugar water	0.24-0.30 mg/bee	positive	apontosis of brain colls confirmed
612	lab	imidicloprid	bology/Development of hypopharyngeal	oral/pollen/sugar water	2.1 (sugar water)	positive	apoptosis of brain cens committee
612	lab	imidicloprid	electronbysiology	oral/pollen/sugar water	2.1 (sugar water)	positive	nypophal yngeal gianus significantiy sinaller
616	lab	imidicloprid	hebavior/avoidance	contact/oral/dust	1 28 ng/bee	negative	not significant
622	lab	imidicloprid	behavior/roflox	oral/sugar water	1.28 hg/bee	negative	not significant
625	lab	imidicloprid	mortality	oral/sugar water	1000 pmol/l	negative	mortality significantly higher
625	lab	imidicloprid	hobayior/roflex	oral/sugar water	1000 nmol/l	positive	significant impairment of all functions
654	lab	imidicloprid	acotylcholinostoraso activity/brain	not stated	205 pM	positive	inhibited ACHe receptors
054 CE4	lab	imidicioprid		not stated	293 IIIvi	positive	inhibited ACHe response
667	field	imidicloprid	acetyiciloimesterase activity/brain	not stated	200 IIIvi	positive	infibiled ACHE response
602	field	imidicioprid	montality	contact/dust		positive	
690	lielu	imidicioprid	colony parameters/collapse	film mathed	0.25 ml/l	negative	study reported that there were other plants in the
697	lab	imidicioprid	mortality	film method	0.25 ml/L	positive	mortality 4 times higher
697	IdD	imuciopriu	mortality	film method		positive	mortality 4 times nigher
697 744	lab	imidicioprid	mortality feeding rate		0.75 mi/L	positive	mortality 4 times nigner
744	lab	imidicioprid	reeding rate	oral/sugar water	0.08-125 ug/L	negative	no difference
744	lab	imidicioprid	survival/longevity	oral/sugar water	0.08-125 ug/L	negative	no difference
753	lab	imidicioprid	capped brood rate	into laraval combs		positive	significantly different than control. Wost removed
753	lab	imidicioprid	pupation rate	Into laraval combs	24 ng/larava	positive	pupation rates significantly affected
/53	lab	imidicioprid	eclosion rate	into laraval combs	2000 ng/larava	positive	eclosion rates significantly affected from 2000 up
/53	lab	imidicloprid	behavior/probosis extenion/PER	into laraval combs	0.04 ng/larva	positive	significant olfactory impairment dose dependent
758	lab	imidicioprid	mortality	oral/food	68ppb	negative	Formula was adjusted by Abbott and then retested
/58	lab	imidicloprid	mortality	oral/food	96ppb	positive	Formula was adjusted by Abbot
/83	lab	imidicloprid	genetic change/larval gene expression	oral tormula	200ppm	negative	significantly more dead than controls
818	tield	imidicloprid	colony parameters/collapse	al supplemental for overwir	it U μg/kg	control	1 of 4 colonies collapsed at 23 weeks
818	tield	imidicloprid	colony parameters/collapse	al supplemental for overwir	htJ.1 (4wk)/20 (9wk) μg/k	positive	3 of 4 colonies collapsed at 19-23 weeks
818	tield	imidicloprid	colony parameters/collapse	al supplemental for overwir	ntL.1 (4wk)/ 40 (9wk) μg/k	positive	4 of 4 colonies collapsed starting at 16 weeks
818	tield	imidicloprid	colony parameters/collapse	al supplemental for overwir	nt.3 (4wk)/ 200 (9wk) µg/k	positive	All colonies failed
818	field	imidicloprid	colony parameters/collapse	al supplemental for overwir	nt).5 (4wk)/ 400 (9wk) μg/	positive	All colonies failed between 14 and 18 weeks

with dosage

area that are favored over the maize

l by nurse bees

d providing stated results

820	lab	imidicloprid	behavior/distance travelled	oral/sugar water	50-500 ppb	borderline	difference not considered significant
820	lab	imidicloprid	behavior/interaction	oral/sugar water	50-500 ppb	positive	lower dose no effect/ higher dose strong effect
820	lab	imidicloprid	behavior/time in food zone	oral/sugar water	50-500 ppb	positive	less interaction dose dependent
823	lab	imidicloprid	behavior/foraging and waggle dance	oral	24 ppb	positive	no difference in foragaging but significant difference
823	lab	imidicloprid	behavior/PEReflex	oral	24-241 ppb	positive	Fewer PER responses that were further reduced by
859	lab	imidicloprid	mortality	contact/topical	0.005-0.03 μg/bee	borderline	imidicloprid toxicity not affected by diet
863	field	imidicloprid	colony parameter	oral supplements	5-20 ppb	positive	difficulty when exposed to other toxins as compare
865	field	imidicloprid	mortality	contact/dust	30-3661 ng/bee	positive	100% mortality in high humidity
868	field	imidicloprid	behavior/foraging	oral/sugar water	0.15-6ng/bee	positive	number of feeder visits decreased by up to 98%
868	field	imidicloprid	behavior/homing	oral/sugar water	0.15-6ng/bee	positive	at 3ng, reduced mobility observed
868	field	imidicloprid	behavior/foraging	oral/sugar water	0.15-6ng/bee	positive	trip duration increased by 50% to 130%
868	field	imidicloprid	behavior/foraging	oral/sugar water	0.15-6ng/bee	positive	time spent at feeder increased up to 47%
868	field	imidicloprid	behavior/foraging	oral/sugar water	0.15-6ng/bee	positive	flight time to feeder increased up to 241%
868	field	imidicloprid	behavior/foraging	oral/sugar water	0.15-6ng/bee	positive	intervals between feedings increased by 33% up to
868	field	imidicloprid	behavior/homing rates	oral/sugar water	0.15-6ng/bee	positive	80% fewer bees returned. Demonstrated distended
868	field	imidicloprid	behavior/homing	oral/sugar water	0.5-2 ng/bee	positive	feeder visits reduced significantly
868	field	imidicloprid	behavior/foraging rate	oral/sugar water	0.5-2 ng/bee	positive	duration of trips significantly affected
868	field	imidicloprid	behavior/foraging	oral/sugar water	0.5-2 ng/bee	positive	time spent at feeder increased by up to 100%
868	field	imidicloprid	behavior/foraging/trip duration	oral/sugar water	0.5-2 ng/bee	positive	duration of trips significantly affected
868	field	imidicloprid	behavior/foraging	oral/sugar water	1.5-3 ng/bee	positive	intervals between flights significantly increased
868	field	imidicloprid	behavior/feeding	oral/sugar water	1.5-3 ng/bee	positive	time in hive increased
915	field	imidicloprid	behavior/flower visits	contact/foraging	0.02%	positive	number of visits to flowers reduced
920	field	imidicloprid	colony parameter/survival	contact/foraging	dust	positive	higher mortality, higher queen mortality and lower
935	lab	imidicloprid	mortality	oral/sugar water	-50 ng/µl 1mM verapam	borderline	significantly higher mortality
984	lab	imidicloprid	behavior/reflex/PER	oral/sugar water	0.3-0.6 ng/bee	positive	PER significantly affected
984	lab	imidicloprid	behavior/reflex	oral/sugar water	0.3-0.6 ng/bee	negative	not significant
1005	lab	imidicloprid	development/cell death	oral/larval food	400 ppm	positive	high rate of apoptosis
1023	lab	imidicloprid	morphology/acini diameter	oral/sugar water	1 ppb	positive	acini declined by dose
1074	cage	imidicloprid	mortality	oral/pollen	48ng/g	negative	20% mortality compared to 15%
1074	cage	imidicloprid	chronic food consu.	oral/pollen	48ng/g	positive	consumption of treated pollen significantly less
1075	lab	imidicloprid	behavior/navigation	oral/pollen	48ppb	positive	navigation significantly impaired
1075	lab	imidicloprid	behavior/PEReflex	oral/pollen	48ppb	positive	not significant
1076	field	imidicloprid	colony parameter/collapse	unknown origin	27 (14-39) ng/g	positive	colonies contaminated by unknown source of neon
1107	lab	imidicloprid	genetic/change	oral/sugar water	10mg.l	positive	The AccGtpx-1 gene was induced after treatments v
1118	lab	imidicloprid	ethyl oleate production	oral/sugar water	7 μg/kg	negative	not significant
1133	lab	imidicloprid	mortality	oral/sugar water	0.7-70 μg/l	positive	Highest mortality in bees infected with Nosema
1133	lab	imidicloprid	immunity/Total haemolymph count	oral/sugar water	0.7-70 μg/l	negative	not significant
1153	lab	imidicloprid	mortality/neurotoxicy	oral/food	500 ng/kg	positive	Decrease in HPG acinal diameter with exposure dur
1164	field	imidicloprid	behavior/activity	contact/foraging	0.004-0.008 % a.i.	positive	Activity less with exposure
1213	lab	imidicloprid	mortality	contact/filter paper	25 g a.i./ha	positive	50% mortality in 24 hours
1264	field	imidicloprid	colony parameters	contact/foraging	varied	negative	not significant
1265	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	100%mortality at 0 hours aged residue
1265	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	87% mortality over two seasons for 1 hour residue
1265	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	74% mortality for 4 hour residue
1265	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	64% mortality for 8 hour residue
1265	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	41% mortality for 24 hour aged residues
1265	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	22% mortality for 48 hour aged residues
1265	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	15% mortality for 72 hour aged residues
1265	lab	imidicloprid	mortality	all routes	25.0 g a.i./ha	positive	7.5% mortality for 120 hour aged residues
1277	field	imidicloprid	colony parameter/collapse	contact foraging maize	dust	negative	"However, additional studies are needed to better u
1312	field	imidicloprid	mortality	oral/sugar water	3.55 ng a.i./L	negative	neurotocity determined
1312	field	imidicloprid	colony parameter	oral/sugar water	3.55 ng a.i./L	negative	"Our observations point towards decays of ove
1312	field	imidicloprid	mortality	oral/sugar water	3.55 ng a.i./L	negative	
1312	field	imidicloprid	colony parameter	oral/sugar water	3.55 ng a.i./L	negative	
1312	field	imidicloprid	mortality	oral/sugar water	3.55 ng a.i./L	negative	study abstract says positive for all but one endpoint

ce in dance y dose increase

ed to controls

993% respectively d bellies, legs shaking, death

hive weight

nics. with imidacloprid

ration.

understandcolony health.

erall colony

1358	field	imidicloprid	behavior/foraging	oral/sugar water	50-6000 μg/l	positive	At concentrations >1200µg/l, all bees showed abnor
1400	lab	imidicloprid	behavior/foraging	oral/sugar water	48 μg/kg(ppb)	negative	But bees took significantly longer to consume sugar
1400	lab	imidicloprid	mortality	oral/sugar water	48 μg/kg(ppb)	negative	Mortality did not increase
1419	lab	imidicloprid	electrophysiology	direct to antenae	3.4 μM	borderline	partial agonist of nAChRs on AL neurones,
1644	field	imidicloprid	mortality	contact/foraging	0.02%	positive	69% mortality at 72 hours
1708	cage	imidicloprid	mortality	oral/sugar water	48ug/kg	negative	no significant difference in mortality
1708	cage	imidicloprid	food intake	oral/sugar water	48ug/kg	positive	lower food intake in treated group
1708	cage	imidicloprid	behavior/foraging	oral/sugar water	48ug/kg	positive	significantly less foraging behavior in treated group
1708	cage	imidicloprid	behavior/learning	oral/sugar water	48ug/kg	borderline	learning impaired but not significant
1709	lab	imidicloprid	mortality	contact corn tassels	1.6/2,5 g a.i. /kg seed	negative	not significant
1709	lab	imidicloprid	mortality	contact corn tassels	1.25 mg a.i./seed	negative	not significant
1709	lab	imidicloprid	mortality	contact corn tassels	1.25 mg a.i./seed	negative	not significant
1760	field	imidicloprid	behavior/activity	oral/food	0.5-5.0 μg/lin syrup	negative	not significant
1760	field	imidicloprid	mortality	oral/food	0.5-5.0 μg/lin syrup	negative	not significant
1760	field	imidicloprid	colony parameter/weight gain	oral/food	0.5-5.0 μg/lin syrup	negative	not significant
1760	field	imidicloprid	behavior/pollen carrying	oral/food	0.5-5.0 μg/lin syrup	positive	significant increase in pollen carrying
1760	field	imidicloprid	brood development	oral/food	0.5-5.0 μg/lin syrup	positive	significant difference in capped brood
1801	semi-field	imidicloprid	behavior/foraging	oral/sugar water	6 μg/kg	positive	significant difference in activity that was dose and ti
1803	field	imidicloprid	behavior/number foraging	ora/sugar water	45.9 g a.i./ha	negative	not significant
1836	lab	imidicloprid	behavior/reflex	oral/sugar water	24 µg/kg	positive	PER significantly affected
1836	semi-field	imidicloprid	behavior/learning	oral/sugar water	24 µg/kg	positive	foraging behavior significantly impaired
1839	lab	imidicloprid	behavior/symptoms	oral/sugar water	20-50 µg/kg	positive	hyperactivity - tremors - higher mortality
1845	lab	imidicloprid	behavior/PER	oral/sugar water	12 ng/bee	positive	significant decrease in performance
1845	lab	imidicloprid	histochemestry	oral/sugar water	0.12-12 ng/bee	positive	A significant increase of CO staining
1888	lab	imidicloprid	effects of long term exposure	oral/sugar water	4-8 µg/L	borderline	some changes but not in all endpoints
1921	lab	imidicloprid	sublethal/activities	oral/sugar water	100-500 ppb	positive	significantly less active
1921	lab	imidicloprid	sublethal/activities	oral/sugar water	100-500 ppb	positive	effects within 1 hour vanished after 30 hours
1922	field	imidicloprid	behavior/foragaing	oral/sugar water	100-1000 ppb	positive	100% mortality after 24 hours at higher dosage
1923	semi-field	imidicloprid	behavior/foraging	contact and oral	0.6-14 g a.i./ha	positive	significant foragaging impairment at higher dosages
1923	semi-field	imidicloprid	mortality	contact and oral	0.6-14 g a i /ha	negative	no effect
1924	field	imidicloprid	colony parameters	sunflower/field	0.24 mg/seed	negative	hives were placed in field when flowers bloomed no
1924	field	imidicloprid	colony parameters	sunflower/field	0.24 mg/seed	negative	hive placed after bloom
1924	field	imidicloprid	colony parameters	sunflower/field	0.24 mg/seed	negative	hive placed after bloom
1924	field	imidicloprid	colony parameters	sunflower/field	0.24 mg/seed	negative	hive placed at bloom time
1924	field	imidicloprid	colony parameters	sunflower/field	0.24 mg/seed	negative	hive placed at bloom time
1924	field	imidicloprid	colony parameters	sunflower/field	0.24 mg/seed	negative	hive placed at bloom time
1924	field	imidicloprid	colony parameters	sunflower/field	0.24 mg/seed	negative	hive placed at bloom time
1924	field	imidicloprid	colony parameters	sunflower/field	0.24 mg/seed	negative	hive placed at bloom time
1024	field	imidicloprid	colony parameters	sunflower/field	0.24 mg/seed	negative	hive placed at bloom time
1924	field	imidicloprid	ony parameters/summer dev/winter survi	oral/sugar water	0.24 mg/seed	negative	not significant
10/13	lah	imidicloprid	imidiclonrid hinding site	head membranes	110 µM	nositive	not significant $(1C50)$ 1-9 $\mu$ M) of [3H]TCP binding t
10/0	lab	imidicloprid	hebayior/PER	oral/sugar water	0.1-1 ng/bee	positive	significant impairment of PER function
1957	lab	imidicloprid	mortality	oral/sugar water	30.6  ng/bee	positive	mortality significantly higher
1054	lab	imidicloprid	mortality	oral/sugar water	30.6 ng/bee	positive	mortality significantly higher
1954	lab	imidicloprid	mortality	oral/sugar water	30.6 ng/bee	positive	mortality significantly higher
1054	lab	imidicloprid	mortality	oral/sugar water	20.6 ng/bee	positive	not significant
1054	lab	imidicloprid	sublotbal/food intako	oral/sugar water	1 5 48 µg/kg	negative	not significant
1954	lab	imidicloprid	sublethal/food intake	oral/sugar water	1.3-40  ug/kg	negative	right significant
1954	lab	imidicloprid	behavior/DEP	oral/sugar water	50-240 ug/kg	positive	significantly lower rood intake
1954	lab	imidicloprid	behavior/PER	oral/sugar water	48 ug/kg	positive	significant impairment of PER function
1054	iau Iab	imidicloprid		oral/sugar water	40 Ug/ Kg 1 5-06 ug/kg	positivo	significant impairment of PEP function
1070	idu Iah	imidiclossid		oral/solution	T'3-20 nR\ KR	positive	Significant impairment of PER function
1070	IdD	imidial and id	mortality	oral/solution		positive	100% mortality at 200 minutes at lawset days
1070	Ubi	imidicloprid	mortality	oral/solution		positive	70% mortality at 300 minutes at lowest dose
19/0	Ubl	imucioprid	mortality	Ordi/Solution		positive	90% mortality at .05%
2060	abi	imacioprid	penavior/gustatory threshold	contact/topical	5 ng/bee	positive	significant loss of sensitivity

rmal foraging behaviour. <sup>r</sup> water

ime dependent

ot when planted so seed dust not present

to Apis head membranes,

2060	lab	imidicloprid	behavior/locomotion	contact/topical	1.25-5 ng/bee	positive	significant increase in immobility and loss of coordination
2060	lab	imidicloprid	behavior/PER	contact/topical	1.25ng/bee	positive	significant impairment of PER function
2060	lab	imidicloprid	histochemestry	cranial injection	1.25ng/bee	positive	significant staining observed
2095	lab	imidicloprid	behavior/PER	oral/sugar water	1.25-20 ng/bee	positive	significant impairment of PER function
2096	lab	imidicloprid	mortality	oral/sugar water	0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
2112	lab	imidicloprid	behavior/PER	contact/topical	0.1-10 ng/bee	positive	significant impairment of PER function
2139	semi-field	imidicloprid	behavior/foraging	oral/food/honev	0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
2139	semi-field	imidicloprid	honey production	oral/food/honey	0.002-0.02 mg/kg	negative	
2139	semi-field	imidicloprid	colony parameter/weight gain	oral/food/honey	0.002-0.02 mg/kg	negative	
2139	semi-field	imidicloprid	colony parameter/offspring	oral/food/honey	0 002-0 02 mg/kg	negative	
2139	semi-field	imidicloprid	colony parameter/brood dev	oral/food/honey	0.002 - 0.02 mg/kg	negative	
2139	semi-field	imidicloprid	colony parameter/brood dev	oral/food/honey	0.002-0.02 mg/kg	negative	
2133	semi-field	imidicloprid	colony parameter/brood dev	oral/food/honey	0.002-0.02 mg/kg	negative	
2133	semi-field	imidicloprid	mortality	oral/food/honey	$0.002 \ 0.02 \ mg/kg$	negative	
2155	field	imidicloprid	hebavior/orientation/foraging	oral/sugar water	10-100nnh	nositive	significant changes in endpoints measured starting at 20
2157	field	imidicloprid	behavior/orientation/foraging	oral/sugar water	10-100ppb	positive	significant changes in endpoints measured starting at 20
2157	lah	imidicloprid	mortality	oral/diot	2 40ppb	positive	mortality significantly higher
2159	lab	imidicloprid	hobovier/DEP	oral/diet	8-40ppb	positive	significant impoirment of DED function
2159		imidicloprid	behavior/flight	Uldi/ulet	4-40ppb	positive	Significant impairment of PER function
2159	cage	imidicioprid	behavior/flight	oral/sugar water	50ppb 50ppb	positive	flight impaired
2159	Cage	imidicioprid	benavior/learning	oral/sugar water	50ppb	positive	olaractory discrimination fell by 50% but recovered
2160	del	imidicioprid	mortality	oral/sugar water	1-1000ng/bee	positive	100% mortality starting at 200ng/bee
2160	del T	imidicioprid	mortality	oral/sugar water	1-1000ng/bee	positive	toxic to all worker bees
2162	Tunnel	imidicioprid	colony parameters/visits to feeding station	oral/sugar water	50 μg/kg	positive	number of visits declined to 0 during phase 2
2162	Tunnel	imidicloprid	colony parameters/food intake	oral/sugar water	25 μg/kg	positive	decrease in consumption of food
2162	Tunnel	imidicloprid	colony parameters/feeding duration	oral/sugar water	3-100 μg/kg	positive	duration of feeding declined
2183	field	imidicloprid	colony parameters/weight gain	field exposure	0.3-0.8 L/ha	negative	not significant
2183	field	imidicloprid	colony parameter/number returning bees	field exposure	0.3-0.8 L/ha	negative	not significant
2183	field	imidicloprid	colony parameters/pollen carrying	field exposure	0.3-0.8 L/ha	negative	not significant
2183	field	imidicloprid	colony parameters/visits to flowers	field exposure	0.3-0.8 L/ha	negative	not significant
2183	field	imidicloprid	pollination/fruit set	field exposure	0.3-0.8 L/ha	negative	not significant
2183	field	imidicloprid	colony parameter/colony weight	field exposure	0.75 L/ha	negative	not significant
2183	field	imidicloprid	colony parameter/colony growth	field exposure	0.75 L/ha	negative	not significant
2183	field	imidicloprid	colony parameter/brood nest size	field exposure	0.75 L/ha	negative	not significant
2183	field	imidicloprid	colony parameter/comb size	field exposure	0.75 L/ha	negative	not significant
2183	field	imidicloprid	colony parameter/number returning bees	field exposure	0.75 L/ha	negative	not significant
2183	field	imidicloprid	colony parameter/pollen carrying	field exposure	0.75 L/ha	borderline	some changes but not in all endpoints
2207	lab	imidicloprid	:ry/Densitometric analysis for AL and mush	direct to brain	10-8-10-4 M	positive	increased cytochrome oxidase (CO) labelling within 30 r
7260	lab	imidicloprid	mortality	contact/film	20 g a.i./ha	positive	100% mortality at 24 hours
7390	lab	imidicloprid	mortality	oral/sugar water	0.7-70 μg/l	positive	highest mortality at 11 days
7390	lab	imidicloprid	hology/Development of hypopharyngeal g	oral/sugar water	0.7-70 μg/l	positive	Imidacloprid had a greater effect as the acorns were mu
7391	lab	imidicloprid	mortality	oral/sugar water	0.7-70 μg/kg	positive	mortality increase especially with nosema
7391	lab	imidicloprid	sub-lethal/disease status	oral/sugar water	7 μg/kg	positive	disease progressed more rapidly in treated group
7467	field	imidicloprid	behavior/foraging	contact/brassica	140 ml/ha	negative	not significant
7467	field	imidicloprid	behavior/foraging	contact/brassica	168 ml/ha	negative	not significant
7467	field	imidicloprid	behavior/foraging	contact/brassica	196 ml/ha	negative	not significant
7532	field	imidicloprid	behavior/foraging	oral/sugar water	20-100 ppb	positive	mortality increased with dosage
7556	semi-field	imidicloprid	mortality	contact/leaves alfalfa	0.025-0.1 lb a.i./acre	borderline	up to 19% mortality which is more than overwintering
1949	lab	metabolite of im.	behavior/PER	oral/sugar water	1ng/bee	negative	not significant
1949	lab	metabolite of im.	behavior/PER	oral/sugar water	1ng/bee	negative	testing use of metabolite
1949	lab	metabolite of im.	behavior/PER	oral/sugar water	1ng/bee	negative	testing use of metabolite
1949	lab	metabolite of im.	behavior/PER	oral/sugar water	1ng/bee	negative	testing use of metabolite
1949	lab	metabolite of im	behavior/PER	oral/sugar water	10.1-10ng/hee	positive	significant impairment of PER function
1954	lab	metabolite of im	behavior/PER	oral/sugar water	7.5-240 ug/kg	negative	not significant
2096	lab	metabolite of im	mortality	oral/sugar water	0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
2096	lab	metabolite of im	mortality	oral/sugar water	0.1 (0.010-1) ng/hee	positive	mortality significantly increased with dosage levels
2000	100	metabolite of illi.	mortanty	oran sabar water	0.1 (0.010 1) HB/ DCC	POSICIVE	mortancy significancy moreased with absage levels

nation

at 20ppb at 20ppb

30 min in all the structures analysed.

e much more atrophied

2096	lab	metabolite of im.	mortality	oral/sugar water	0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
2096	lab	metabolite of im.	mortality	oral/sugar water	0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
2096	lab	metabolite of im.	mortality	oral/sugar water	0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
2096	lab	metabolite of im.	mortality	oral/sugar water	0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
622	lab	mix - imidicloprid	behavior/reflex	oral/sugar water	1.8ng/bee	negative	not significant
635	lab	mix - imidicloprid	mortality	oral/sugar water	1000 nmol/l	positive	mortality significantly higher
635	lab	mix - imidicloprid	behavio/reflex	oral/sugar water	1000 nmol/l	positive	significant impairment of all functions
1802	lab	mix imidicloprid	mortality	oral/sugar water	1.00.1-10.0 μg/L	positive	significant mortality in all groups
1802	lab	mix imidicloprid	mortality	oral/sugar water	1.00.1-10.0 μg/L	positive	mortality at all levels
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid	23.3 mg/L	positive	more toxic than clothianidin
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid	1.5-100 mg/L	positive	wing block within 1 hour
500	lab	thiamethoxam	organ damage	oral/syrup	0.0428 ng a.i./L diet	positive	sub-lethal doses cause organ damage while metabo
533	field	thiamethoxam	behavior/foraging	field foraging	1/10 LD50	positive	significant reduction of motor coordination
533	field	thiamethoxam	behavior/foraging	field foraging	1/50 LD50	positive	return rate significantly lowered
533	lab	thiamethoxam	behavior/foraging	oral	1/5 of LD50	positive	could not discriminate between food and non food
545	lab	thiamethoxam	mortality	contact/leaves	0.00583 ml/cm2	positive	100% mortality after 2.61 hours
545	lab	thiamethoxam	mortality	contact/spray	0.00583 ml/cm2	positive	100% mortality after 1 hour
545	lab	thiamethoxam	mortality	oral/sugar water	0.00583 ml/cm2	positive	100% mortality after 1.51 hours
569	field	thiamethoxam	mortality	flower foraging	12.6 g a.i./ha	negative	not significant
569	field	thiamethoxam	colony parameter/strength	flower foraging	12.6 g a.i./ha	negative	not significant
569	field	thiamethoxam	colony parameter/returning bees	flower foraging	12.6 g a.i./ha	negative	not significant
569	field	thiamethoxam	colony parameter/food	flower foraging	12.6 g a.i./ha	negative	not significant
569	field	thiamethoxam	colony parameter/hive weight	flower foraging	12.6 g a.i./ha	negative	not significant
569	field	thiamethoxam	mortality	flower foraging	88.2 g a i /ha	negative	not significant
569	field	thiamethoxam	colony parameter/strength	flower foraging	88.2 g a i /ha	negative	not significant
569	field	thiamethoxam	colony parameter/returning hees	flower foraging	88.2 g a i /ha	negative	not significant
569	field	thiamethoxam	colony parameter/food	flower foraging	88.2 g a i /ha	negative	not significant
560	field	thiamethoxam	colony parameter/hive weight	flower foraging	88.2 g a.i./ha	negative	not significant
505 662	field	thiamethoxam	mortality	contact/dust	0.1 mg/seed	nositive	87% mortality with brief ducting
680	field	thiamethoxam	hebayior/flower visits	field foraging	)g insecticide/201 of wat	positive	65% mortality with brief dusting
788	lab	thiamethoxam	subletbal/biomarkers	contact	2 56-51 16	positive	but there were changes in gone expression
700 000	field	thiamethoxam	hobovier/homing rate	oral/sugar water	2.30-31.10	positive	significant reduction in homing up to 21% failed to
000 1005	field	thiamethoxam		dust (sorp	1.54 lig/bee	positive	significant reduction in norming up to 31% railed to
1085	field	thiamethoxam	mortality	dust/com	7.35 g d.1./11d2U%	positive	for a single behavior significantly imposing
1085	liela	thiamethoxam	Denavior/Toraging		7.35 g d.1./11d50%	positive	foraging behavior significantly impaired
1146	del	thiamethoxam	mortality	oral/honey insecticide	5x10-6-1.5x10-3 m/mig	positive	especially high mortality in bees with virus
1146	del	thiamethoxam	mortality	oral/noney insecticide	5x10-6-1.5x10-3 m/mlg	positive	highest mortality in younger bees
1146	lab	thiamethoxam	mortality	oral/honey insecticide	5x10-6-1.5x10-3 m/mlg	positive	90% mortality
1146	lab	thiamethoxam	mortality	oral/honey insecticide	5x10-6-1.5x10-3 m/mlg	positive	younger bees regurgitated but were damaged
1146	lab	thiamethoxam	mortality	oral/honey insecticide	5x10-6-1.5x10-3 m/mlg	negative	In Malpighian tubules treated with insecticide a sm
1164	field	thiamethoxam	behavior/activity	contact/foraging	0.004-0.008 % a.i.	positive	Activity less with exposure
1236	lab	thiamethoxam	behavior/arching and wing block	oral/guttation fluid	47 mg/L	positive	wing block within 2 to 6 minutes
1259	greenhouse	thiamethoxam	mortality	contact/oral/dust	200 g/ha	positive	100% mortality after 330 minutes
1306	lab	thiamethoxam	mortality	spray	150 g/100L H2O	positive	71% mortality after 1 hour, 100% mortality after 9
1306	lab	thiamethoxam	mortality	contaminated diet	150 g/100L H2O	positive	99% mortality at 24 hours
1306	lab	thiamethoxam	mortality	contact/contaminated surface	€ 150 g/100L H2O	positive	56% mortality 1 hour after contact
1306	lab	thiamethoxam	mortality	contact/leaves	150 g/100L H2O	positive	100% mortality at 9 hours
1314	lab	thiamethoxam	mortality	oral/sugar water	0.1-1 ng/bee	negative	
1314	lab	thiamethoxam	behavior	oral/sugar water	0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induc
1314	lab	thiamethoxam	behavior	oral/sugar water	0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly me
1314	lab	thiamethoxam	behavior	oral/sugar water	0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil
1314	lab	thiamethoxam	behavior	oral/sugar water	0.1-1 ng/bee	negative	"Thiamethoxam by contact induced either a sig
1314	lab	thiamethoxam	behavior	contact/topical	0.1-1 ng/bee	negative	"Responsiveness to antennal sucrose stimulat
1314	lab	thiamethoxam	chronic/probiscus extension	contact/topical	0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induc
1314	lab	thiamethoxam	locomotor	contact/topical	0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly m
1314	lab	thiamethoxam	sugar respons3	contact/topical	0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil
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oolizing the pesticide. Damage can reverse

d sources

o return to hive when hive regularly treated

naller basophilic was observed

) hours

iced mortality of all nore time immobile il-treated honeybees

ignificant decrease of olfactory memory

tion was significantly decreased

nced mortality of all nore time immobile

il-treated honeybees failed to discriminate

1314	lab	thiamethoxam	learning	contact/topical	0.1-1 ng/bee	positive	"Thiamethoxam by contact induced either a sig
1370	field	thiamethoxam	mortality	contact/foraging	100-300 g a.i./ha	positive	Mortality increased as exposure and dosage in
1370	field	thiamethoxam	mortality	contact/foraging	15-200 g a.i./ha	positive	Mortality increased as exposure and dosage in
1408	lab	thiamethoxam	behavior/locomotion	oral/sugar water	0.1-1 ng/bee	negative	behavior not significantly affected at this dose
1408	lab	thiamethoxam	behavior/PEReflex	contact/topical	0.1-1 ng/bee	negative	behavior not significantly affected at this dose
1408	lab	thiamethoxam	behavior/locomotion/learning	oral/topical	0.1-1 ng/bee	negative	THIS STUDY TESTED BOTH IMIDICLOPRID AND THI
1408	lab	thiamethoxam	behavior/reflex	topical contact	0.1-1 ng/bee	negative	
1472	lab	thiamethoxam	mortality	contact/citrus leaves	0.20 mg a.i./ml	positive	100% mortality
1472	lab	thiamethoxam	mortality	contact/citrus leaves	0.100 mg a.i./ml	positive	100% mortality
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure	30ml/hl - 12 ± 0.5 hl/ha	positive	foraging behavior significantly impaired
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure	20ml/hl - 12 ± 0.5 hl/ha	positive	sharp decline in foraging followed by partial improv
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard	4g/kg seed	negative	difference not considered significant
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard	0.2 g/litre	positive	number of returning bees greatly affected
7242	lab	thiamethoxam	mortality	oral/sugar water	0.727 ng/bee/d	positive	mortality significantly increased with time
7274	lab	thiamethoxam	Morphology/histochemistry/	oral/sugar water	0.0428-0.428 ng a.i./μL	positive	sublethal doses cause damage to brain and midgut
7302	lab	thiamethoxam	mortality	oral/sugar water	7 (5x10 -9-5x10 -7) ng ai,	positive	100 % mortality at sublethal doses at 234 hours
7302	lab	thiamethoxam	mortality	oral/sugar water	7 (5x10 -9-5x10 -7) ng ai,	positive	80% mortality at 92 hours sub lethal
7302	lab	thiamethoxam	mortality	oral/sugar water	7 (5x10 -9-5x10 -7) ng ai,	positive	high mortality with significant motor coordination of
7302	lab	thiamethoxam	mortality	oral/sugar water	7 (5x10 -9-5x10 -7) ng ai,	positive	100% mortality at 150 hours
7346	lab	thiamethoxam	Enzymes/AChE activity	contact/acetone sol.	not stated	positive	acetylcholinesterase and carboxylesterase significar
7352	field	thiamethoxam	behavior/foraging	oral/sugar water	1-2 ng/bee	positive	significant reduction in number of trips
7352	field	thiamethoxam	behavior/returning bees	oral/sugar water	1-2 ng/bee	positive	time to return significantly higher
7352	field	thiamethoxam	Behavior/returning bees	oral/sugar water	1-2 ng/bee	positive	number returning declined signficiantly
7533	tent		colony parameters/varied	field exposure	0.005 g a.i./m2	negative	not significant

r a significant decrease of olfactory memory age increased age increased

D THIAMEXOXAM BUT ONLY REPORTED THIAMETHOXAM.

mprovement

ation decline in those living

nificantly decreased

654	lab	imidicloprid	acetylcholinesterase activity/brain	not stated
654	lab	imidicloprid	acetylcholinesterase activity/brain	not stated
143	cage	imidicloprid	avoidance/food intake	oral/sugar water
635	lab	mix - imidicloprid	behavio/reflex	oral/sugar water
1011	semi-field	clothianidin	behavior	contact/oral/dust
1314	lab	thiamethoxam	behavior	contact/topical
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1164	field	imidicloprid	behavior/activity	contact/foraging
1164	field	thiamethoxam	behavior/activity	contact/foraging
1760	field	imidicloprid	behavior/activity	oral/food
0	lab	clothianidin	behavior/arching and wing block	oral.guttation fluid
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid
0	lab	imidicloprid	behavior/arching and wing block	oral.guttation fluid
0	lab	clothianidin	behavior/arching and wing block	oral.guttation fluid
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid
1236	lab	thiamethoxam	behavior/arching and wing block	oral/guttation fluid
616	lab	imidicloprid	behavior/avoidance	contact/oral/dust
534	lab	imidicloprid	behavior/coordination	oral
820	lab	imidicloprid	behavior/distance travelled	oral/sugar water
868	field	imidicloprid	behavior/feeding	oral/sugar water
521	lab	imidicloprid	behavior/feeding	oral/syrup
2159	cage	imidicloprid	behavior/flight	oral/sugar water
915	field	imidicloprid	behavior/flower visits	contact/foraging
680	field	thiamethoxam	behavior/flower visits	field foraging
1922	field	imidicloprid	hehavior/foragaing	oral/sugar water
1923	semi-field	imidicloprid	behavior/foraging	contact and oral
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
7467	field	imidicloprid	behavior/foraging	contact/brassica
7467	field	imidicloprid	behavior/foraging	contact/brassica
7467	field	imidicloprid	behavior/foraging	contact/brassica
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
143	cage	imidicloprid	behavior/foraging	field exposure/apple
143	cage	imidicloprid	behavior/foraging	field exposure/dandelion
533	field	thiamethoxam	behavior/foraging	field foraging
533	field	thiamethoxam	behavior/foraging	field foraging
533	lah	thiamethoxam	behavior/foraging	oral
2139	semi-field	imidicloprid	behavior/foraging	oral/food/honey
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	clothianidin	behavior/foraging	oral/sugar water
868	fiold	imidicloprid	hehavior/foraging	oral/sugar water
868	fiold	imidicloprid	hehavior/foraging	oral/sugar water
868	fiold	imidicloprid	hehavior/foraging	oral/sugar water
1250	field	imidicloprid	helpsvior/foraging	oral/sugar water
1000	neiu	maiciophia	benavior/ioraging	Unan Sugar Water

1400	lab	imidicloprid	behavior/foraging	ora
1708	cage	imidicloprid	behavior/foraging	ora
1801	semi-field	imidicloprid	behavior/foraging	ora
7352	field	thiamethoxam	behavior/foraging	ora
7532	field	imidicloprid	behavior/foraging	ora
823	lab	imidicloprid	behavior/foraging and waggle dance	
868	field	imidicloprid	behavior/foraging rate	ora
868	field	imidicloprid	behavior/foraging/trip duration	ora
2060	lab	imidicloprid	behavior/gustatory threshold	со
505	lab	imidicloprid	behavior/homing	ora
505	lab	clothianidin	behavior/homing	ora
868	field	imidicloprid	behavior/homing	ora
868	field	imidicloprid	behavior/homing	ora
833	field	thiamethoxam	behavior/homing rate	ora
868	field	imidicloprid	behavior/homing rates	ora
820	lab	imidicloprid	behavior/interaction	ora
580	lab	imidicloprid	behavior/learning	
1708	cage	imidicloprid	behavior/learning	ora
1836	semi-field	imidicloprid	behavior/learning	ora
2159	cage	imidicloprid	behavior/learning	ora
2060	lab	, imidicloprid	behavior/locomotion	со
1408	lab	thiamethoxam	behavior/locomotion	ora
1408	lab	thiamethoxam	behavior/locomotion/learning	(
1075	lab	imidicloprid	behavior/navigation	
1803	field	imidicloprid	behavior/number foraging	ora
2157	field	imidicloprid	behavior/orientation/foraging	ora
2157	field	imidicloprid	behavior/orientation/foraging	ora
2060	lab	imidicloprid	behavior/PER	CO
2112	lab	imidicloprid	behavior/PER	co
2159	lab	imidicloprid	behavior/PER	
1949	lab	imidicloprid	behavior/PER	ora
1949	lab	metabolite of im.	behavior/PER	ora
1949	lab	metabolite of im.	behavior/PER	ora
1949	lab	metabolite of im.	behavior/PER	ora
1949	lab	metabolite of im.	behavior/PER	ora
1949	lab	metabolite of im.	behavior/PER	ora
1954	lab	imidicloprid	behavior/PER	ora
1954	lab	imidicloprid	behavior/PER	ora
1954	lab	metabolite of im.	behavior/PER	ora
1954	lab	imidicloprid	behavior/PER	ora
2095	lab	imidicloprid	behavior/PER	ora
1845	lab	imidicloprid	behavior/PER	ora
1408	lab	thiamethoxam	behavior/PFReflex	CO
823	lab	imidicloprid	behavior/PEReflex	
1075	lab	imidicloprid	behavior/PEReflex	
1760	field	imidicloprid	behavior/pollen carrying	·
753	lah	imidicloprid	behavior/probosis extenion/PFR	into
535	lab	imidicloprid	behavior/reflex	אני
622	lab	imidicloprid	behavior/reflex	ora
622	lab	mix - imidicloprid	behavior/reflex	ora
				5.0

al/sugar water al/sugar water al/sugar water al/sugar water al/sugar water oral al/sugar water al/sugar water ntact/topical al/sugar water oral/honey al/sugar water al/sugar water al/sugar water ntact/topical al/sugar water oral/topical oral/pollen a/sugar water al/sugar water al/sugar water ntact/topical ntact/topical oral/diet al/sugar water ntact/topical oral oral/pollen oral/food laraval combs ssumed oral al/sugar water al/sugar water

635	lab	imidicloprid
984	lab	imidicloprid
1836	lab	imidicloprid
1408	lab	thiamethoxam
984	lab	imidicloprid
1690	field	thiamethoxam
1690	field	thiamethoxam
7352	field	thiamethoxam
7352	field	thiamethoxam
1839	lab	imidicloprid
820	lab	imidicloprid
397	lab	imidicloprid
603	lab	imidicloprid
1760	field	imidicloprid
753	lab	imidicloprid
1074	cage	imidicloprid
1314	lab	thiamethoxam
863	field	imidicloprid
1312	field	imidicloprid
1312	field	imidicloprid
750	semi-field	clothianidin
2139	semi-field	imidicloprid
2139	semi-field	imidicloprid
2139	semi-field	imidicloprid
2183	field	imidicloprid
1277	field	imidicloprid
1076	field	imidicloprid
2183	field	imidicloprid
2183	field	imidicloprid
2183	field	imidicloprid
750	semi-field	clothianidin
569	field	thiamethoxam
2183	field	imidicloprid
2183	field	imidicloprid
2139	semi-field	imidicloprid
2183	field	imidicloprid
569	field	thiamethoxam
569	field	thiamethoxam
750	semi-field	clothianidin
569	field	thiamethoxam
569	field	thiamethoxam
7303	semi-field	clothianidin
920	field	imidicloprid
750	semi-field	clothianidin
1532	field	clothianidin
1760	field	imidicloprid
2139	semi-field	imidicloprid
-		- F %

behavior/reflex behavior/reflex behavior/reflex behavior/reflex behavior/reflex/PER Behavior/returning bees Behavior/returning bees behavior/returning bees Behavior/returning bees behavior/symptoms behavior/time in food zone binding to acetylcholine receptor brain morphology brood development capped brood rate chronic food consu. chronic/probiscus extension colony parameter colony parameter colony parameter colony parameter/behavior colony parameter/brood dev. colony parameter/brood dev. colony parameter/brood dev. colony parameter/brood nest size colony parameter/collapse colony parameter/collapse colony parameter/colony growth colony parameter/colony weight colony parameter/comb size colony parameter/flight colony parameter/food colony parameter/food colony parameter/hive weight colony parameter/hive weight olony parameter/number returning be plony parameter/number returning be colony parameter/offspring colony parameter/pollen carrying colony parameter/returning bees colony parameter/returning bees colony parameter/strength colony parameter/strength colony parameter/strength colony parameter/strength colony parameter/survival colony parameter/thermoregulation colony parameter/weight colony parameter/weight gain colony parameter/weight gain

oral/sugar water oral/sugar water topical contact oral/sugar water contact/foraging mustard contact/foraging mustard oral/sugar water oral/sugar water oral/sugar water oral/sugar water oral/sugar water oral/food into laraval combs oral/pollen contact/topical oral supplements oral/sugar water oral/sugar water contact oral/food/honey oral/food/honey oral/food/honey field exposure contact foraging maize unknown origin field exposure field exposure field exposure contact flower foraging flower foraging flower foraging flower foraging field exposure field exposure oral/food/honey field exposure flower foraging flower foraging contact flower foraging flower foraging talc/contact contact/foraging contact contact/foraging canola oral/food oral/food/honey

oral/sugar water

895	field	combination of all	colony parameters	contact/foraging
1264	field	imidicloprid	colony parameters	contact/foraging
689	field	clothianidin	colony parameters	field exposure
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
690	field	clothianidin	colony parameters/collapse	maize flower foraging
690	field	imidicloprid	colony parameters/collapse	maize flower foraging
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
2162	Tunnel	imidicloprid	colony parameters/feeding duration	oral/sugar water
2162	Tunnel	imidicloprid	colony parameters/food intake	oral/sugar water
2183	field	imidicloprid	colony parameters/pollen carrying	field exposure
1934	field	imidicloprid	ny parameters/summer dev/winter sur	oral/sugar water
7533	tent		colony parameters/varied	field exposure
2162	Tunnel	imidicloprid	ony parameters/visits to feeding static	oral/sugar water
2183	field	imidicloprid	colony parameters/visits to flowers	field exposure
2183	field	imidicloprid	colony parameters/weight gain	field exposure
1005	lab	imidicloprid	development/cell death	oral/larval food
753	lab	imidicloprid	eclosion rate	into laraval combs
1888	lab	imidicloprid	effects of long term exposure	oral/sugar water
1419	lab	imidicloprid	electrophysiology	direct to antenae
612	lab	imidicloprid	electrophysiology	oral/pollen/sugar water
7346	lab	thiamethoxam	Enzymes/AChE activity	contact/acetone sol.
601	cage	imidicloprid	enzymes/aCHe activity	oral/sugar water
601	cage	clothianidin	enzymes/aCHe activity	oral/sugar water
1118	lab	imidicloprid	ethyl oleate production	oral/sugar water
744	lab	imidicloprid	feeding rate	oral/sugar water
1708	cage	imidicloprid	food intake	oral/sugar water
783	lab	imidicloprid	genetic change/larval gene expression	oral formula
1107	lab	imidicloprid	genetic/change	oral/sugar water
2060	lab	imidicloprid	histochemestry	cranial injection
1845	lab	imidicloprid	histochemestry	oral/sugar water
2207	lab	imidicloprid	/Densitometric analysis for AL and mu	direct to brain
1532	field	clothianidin	honey production	contact/foraging canola
2139	semi-field	imidicloprid	honey production	oral/food/honey
1943	lab	imidicloprid	imidicloprid binding site	head membranes
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
		•		· •

557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water
557	lab	imidicloprid	immunity/deformed wing virus	oral/sugar water
557	lab	clothianidin	immunity/immune response	contact/topical
557	lab	clothianidin	immunity/immune response	contact/topical
1133	lab	imidicloprid	immunity/Total haemolymph count	oral/sugar water
1314	lab	thiamethoxam	learning	contact/topical
1314	lab	thiamethoxam	locomotor	contact/topical
504	lab	imidicloprid	molecular response/gene expression	oral/sugar water
7390	lab	imidicloprid	logy/Development of hypopharyngeal	oral/sugar water
1023	lab	imidicloprid	morphology/acini diameter	oral/sugar water
529	lab	imidicloprid	morphology/apoptosis nerve cells	oral
612	lab	imidicloprid	ology/Development of hypopharyngea	oral/pollen/sugar water
7274	lab	thiamethoxam	Morphology/histochemistry/	oral/sugar water
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
750	semi-field	clothianidin	mortality	contact
884	semi-field	clothianidin	mortality	contact
1186	greenhouse	clothianidin	mortality	contact
1923	semi-field	imidicloprid	mortality	contact and oral
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	clothianidin	mortality	contact corn tassels
143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
319	cage	imidicloprid	mortality	contact/alfalfa
326	cage	imidicloprid	mortality	contact/alfalfa

1472	lab	thiamethoxam
1472	lab	thiamethoxam
1306	lab	thiamethoxam
662	field	clothianidin
662	field	imidicloprid
662	field	thiamethoxam
865	field	clothianidin
865	field	imidicloprid
486	desk	clothianidin
486	desk	anidin and thiameth
7260	lab	imidicloprid
7260	lab	clothianidin
1213	lab	imidicloprid
978	field	clothianidin
978	field	clothianidin
1171	field	clothianidin
1370	field	thiamethoxam
1370	field	thiamethoxam
1644	field	imidicloprid
1532	field	clothianidin
750	lab	clothianidin
750	lab	clothianidin
1306	lab	thiamethoxam
545	lab	thiamethoxam
7556	semi-field	imidicloprid
1011	semi-field	clothianidin
1259	greenhouse	thiamethoxam
545	lab	thiamethoxam
859	lab	imidicloprid
1306	lab	thiamethoxam
1085	field	thiamethoxam
1180	cage	clothianidin
697	lab	imidicloprid
697	lab	imidicloprid
697	lab	imidicloprid
569	field	thiamethoxam
569	field	thiamethoxam
2159	lab	imidicloprid
758	lab	imidicloprid
758	lab	imidicloprid
1760	field	imidicloprid
2139	semi-field	imidicloprid
1146	lab	thiamethoxam
1074	cage	imidicloprid
1970	lab	imidicloprid
1970	lab	imidicloprid

mortality mortality

contact/citrus leaves contact/citrus leaves ontact/contaminated surface contact/dust contact/dust contact/dust contact/dust contact/dust contact/dust/corn contact/dust/corn contact/film contact/film contact/filter paper contact/foraging contact/foraging contact/foraging contact/foraging contact/foraging contact/foraging contact/foraging canola contact/leaves contact/leaves contact/leaves contact/leaves contact/leaves alfalfa contact/oral/dust contact/oral/dust contact/spray contact/topical contaminated diet dust/corn field exp./potato film method film method film method flower foraging flower foraging oral/diet oral/food oral/food oral/food oral/food/honey oral/honey insecticide oral/honey insecticide oral/honey insecticide oral/honey insecticide oral/honey insecticide oral/pollen oral/solution oral/solution

1970	lab	imidicloprid	mortality	oral/solution
504	lab	imidicloprid	mortality	oral/sugar water
545	lab	thiamethoxam	mortality	oral/sugar water
601	cage	clothianidin	mortality	oral/sugar water
635	lab	imidicloprid	mortality	oral/sugar water
635	lab	mix - imidicloprid	mortality	oral/sugar water
935	lab	imidicloprid	mortality	oral/sugar water
1133	lab	imidicloprid	mortality	oral/sugar water
1312	field	imidicloprid	mortality	oral/sugar water
1312	field	imidicloprid	mortality	oral/sugar water
1312	field	imidicloprid	mortality	oral/sugar water
1314	lab	thiamethoxam	mortality	oral/sugar water
1400	lab	imidicloprid	mortality	oral/sugar water
1708	cage	imidicloprid	mortality	oral/sugar water
1802	lab	mix imidicloprid	mortality	oral/sugar water
1802	lab	mix imidicloprid	mortality	oral/sugar water
1954	lab	imidicloprid	mortality	oral/sugar water
1954	lab	imidicloprid	mortality	oral/sugar water
1954	lab	imidicloprid	mortality	oral/sugar water
1954	lab	imidicloprid	mortality	oral/sugar water
2096	lab	imidicloprid	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2160	lab	imidicloprid	mortality	oral/sugar water
2160	lab	imidicloprid	mortality	oral/sugar water
7242	lab	thiamethoxam	mortality	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
7390	lab	imidicloprid	mortality	oral/sugar water
7391	lab	imidicloprid	mortality	oral/sugar water
1306	lab	thiamethoxam	mortality	spray
7303	semi-field	clothianidin	mortality	talc/contact
601	cage	imidicloprid	, mortality/hyperactivity	oral/sugar water
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water
1153	lab	imidicloprid	mortality/neurotoxicy	oral/food
1532	field	clothianidin	offspring production	contact/foraging canola
500	lab	thiamethoxam	organ damage	oral/syrup
1532	field	clothianidin	Over-wintering	contact/foraging canola
2183	field	imidicloprid	pollination/fruit set	field exposure
753	lab	imidicloprid	pupation rate	into laraval combs
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
788	lab	thiamethoxam	sublethal/biomarkers	contact
7391	lab	imidicloprid	sub-lethal/disease status	oral/sugar water

1954	lab	imidicloprid	sublethal/food intake	oral/sugar water
1954	lab	imidicloprid	sublethal/food intake	oral/sugar water
1314	lab	thiamethoxam	sugar respons3	contact/topical
744	lab	imidicloprid	survival/longevity	oral/sugar water

295 nM	positive	inhibited ACHe response
200 nM	positive	inhibited ACHe response
10 ppm	positive	85% fewer feeding visits
1000 nmol/l	positive	significant impairment of all functions
0.5-2 g a.i./ha	positive	risk greatest at edge of field
0.1-1 ng/bee	negative	"Responsiveness to antennal sucrose stimulation was significantly decreased
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeybees after
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed to discrin
0.1-1 ng/bee	negative	"Thiamethoxam by contact induced either a significant decrease of olfactory mem
0.004-0.008 % a.i.	positive	Activity less with exposure
0.004-0.008 % a.i.	positive	Activity less with exposure
0.5-5.0 μg/lin syrup	negative	not significant
23.3 mg/L	positive	wing block within 2 to 9 minutes
23.3 mg/L	positive	more toxic than clothianidin
6.25-100 mg/L	positive	wing block within 2 to 9 minutes
23.3 mg/L	positive	dose dependent
1.5-100 mg/L	positive	wing block within 1 hour
47 mg/L	positive	wing block within 2 to 6 minutes
1.28 ng/bee	negative	not significant
1/100 of LD50	positive	loss of coordination
50-500 ppb	borderline	difference not considered significant
1.5-3 ng/bee	positive	time in hive increased
125 μg/L	negative	not significant
50ppb	positive	flight impaired
0.02%	positive	number of visits to flowers reduced
र insecticide/20L of wa	positive	65% mortality with brief dusting
100-1000 ppb	positive	100% mortality after 24 hours at higher dosage
0.6-14 g a.i./ha	positive	significant foragaging impairment at higher dosages
7.35 g a.i./ha50%	positive	foraging behavior significantly impaired
140 ml/ha	negative	not significant
168 ml/ha	negative	not significant
196 ml/ha	negative	not significant
30ml/hl - 12 ± 0.5 hl/h	positive	foraging behavior significantly impaired
20ml/hl - 12 ± 0.5 hl/h	positive	sharp decline in foraging followed by partial improvement
0.112 kg(a.i.)/ ha	negative	no significant difference
0.112 kg(a.i.)/ ha	positive	60% reduction in foraging
1/10 LD50	positive	significant reduction of motor coordination
1/50 LD50	positive	return rate significantly lowered
1/5 of LD50	positive	could not discriminate between food and non food sources
0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
0.15-6ng/bee	positive	number of feeder visits decreased by up to 98%
0.15-6ng/bee	positive	trip duration increased by 50% to 130%
0.15-6ng/bee	positive	time spent at feeder increased up to 47%
0.15-6ng/bee	positive	flight time to feeder increased up to 241%
0.15-6ng/bee	positive	flight time to hive increased up to 210%
0.15-6ng/bee	positive	intervals between feedings increased by 33% up to 993% respectively
0.5-2 ng/bee	positive	time spent at feeder increased by up to 100%
1.5-3 ng/bee	positive	intervals between flights significantly increased
50-6000 μg/l	positive	At concentrations >1200 $\mu$ g/l, all bees showed abnormal foraging behaviour.

48 µg/kg(ppb)	negative	But bees took significantly longer to consume sugar water
48ug/kg	positive	significantly less foraging behavior in treated group
6 μg/kg	positive	significant difference in activity that was dose and time dependent
1-2 ng/bee	positive	significant reduction in number of trips
20-100 ppb	positive	mortality increased with dosage
24 ppb	positive	no difference in foragaging but significant difference in dance
0.5-2 ng/bee	positive	duration of trips significantly affected
0.5-2 ng/bee	positive	duration of trips significantly affected
5 ng/bee	positive	significant loss of sensitivity
7.5-11.25 ng/bee	positive	unable to reach the hive
2.5 ng/bee	positive	longer flight paths
0.15-6ng/bee	, positive	at 3ng, reduced mobility observed
0.5-2 ng/bee	, positive	feeder visits reduced significantly
1.34 ng/bee	, positive	significant reduction in homing up to 31% failed to return to hive when hive regularly trea
0.15-6ng/bee	positive	80% fewer bees returned. Demonstrated distended bellies, legs shaking, death
50-500 ppb	positive	lower dose no effect/ higher dose strong effect
0.1ug/bee	positive	learning and memory significantly impaired
48ug/kg	borderline	learning impaired but not significant
24 ug/kg	positive	foraging behavior significantly impaired
50ppb	positive	olafactory discrimination fell by 50% but recovered
1.25-5 ng/bee	positive	significant increase in immobility and loss of coordination
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
0.1-1 ng/bee	negative	THIS STUDY TESTED BOTH IMIDICI OPRID AND THIAMEXOXAM BUT ONLY REPORTED T
48ppb	positive	
45.9 g a i /ha	negative	not significant
10-100nnh	nositive	significant changes in endpoints measured starting at 20mh
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
1.25ng/bee	positive	significant impairment of PER function
0.1-10 ng/bee	positive	significant impairment of PER function
4-40nnh	nositive	significant impairment of PER function
0 1-1 ng/hee	nositive	significant impairment of PER function
1ng/hee	negative	
1ng/bee	negative	tecting use of metabolite
1ng/bee	negative	testing use of metabolite
1ng/bee	negative	testing use of metabolite
10 1-10ng/bee	nositive	significant impairment of DED function
60-240 ug/kg	positive	significant impairment of PER function
/8 ug/kg	positive	significant impairment of PER function
7 5-240 ug/kg	positive	
1 5-06 ug/kg	negative	significant imposiment of DED function
1.3-30  ug/kg 1.25-20 ng/hee	positive	significant impairment of PER function
1.2.3-20 lig/bee	positive	significant impairment of PER function
$12 \ln g/bee$	positive	significant decrease in performance
0.1-1 lig/bee	negative	benavior not significantly affected at this dose
24-241 µµu 18nnh	positivo	rewer PER responses that were further reduced by dose increase
	positivo	
	positive	significant increase in polien carrying
	positive	significant offactory impairment dose dependent
1/5 UI LU5U	positive	impaired sucrose metabolism
1.011g/ uee	negative	not signincant
T'908/pee	negative	not significant

1000 nmol/l	positive	significant impairment of all functions
0.3-0.6 ng/bee	negative	not significant
24 µg/kg	positive	PER significantly affected
0.1-1 ng/bee	negative	
0.3-0.6 ng/bee	positive	PER significantly affected
4g/kg seed	negative	difference not considered significant
0.2 g/litre	positive	number of returning bees greatly affected
1-2 ng/bee	positive	time to return significantly higher
1-2 ng/bee	positive	number returning declined significiantly
20-50 μg/kg	positive	hyperactivity - tremors - higher mortality
50-500 ppb	positive	less interaction dose dependent
2.53 μM (Ki)	positive	Strong binding
0.809-8.09 ng/bee	positive	apoptosis of brain cells confirmed
0.5-5.0 μg/lin syrup	positive	significant difference in capped brood
24 ng/larava	positive	signficantly different than control. Most removed by nurse bees
48ng/g	positive	consumption of treated pollen significantly less
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeybees after
5-20 ppb	positive	difficulty when exposed to other toxins as compared to controls
3.55 ng a.i./L	negative	"Our observations point towards decays of overall colony vitality
3.55 ng a.i./L	negative	
5.12 ug/m2	negative	no significant change
0.002-0.02 mg/kg	negative	
0.002-0.02 mg/kg	negative	
0.002-0.02 mg/kg	negative	
0.75 L/ha	negative	not significant
dust	negative	"However, additional studies are needed to better understand possible synergistic mecha
27 (14-39) ng/g	positive	colonies contaminated by unknown source of neonics.
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
5.12 ug/m2	positive	flight activity higher in treated group
12.6 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.002-0.02 mg/kg	negative	
0.75 L/ha	borderline	some changes but not in all endpoints
12.6 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
5.12 ug/m2	positive	colony strength affected
12.6 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
51.2 ug/m2	positive	high mortality and colony strength decline
dust	positive	higher mortality, higher queen mortality and lower hive weight
5.12 ug/m2	negative	no change in thermoregulation
32 g a.i./ha	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.002-0.02 mg/kg	negative	

varied	negative	"However, the risk exposure of bee colonies on adverse impact
varied	negative	not significant
DL, 5000x diluted -at 2	negative	"The results indicated that clothianidin spraying of the rice field increased the mortality
0.24 mg/seed	negative	hives were placed in field when flowers bloomed not when planted so seed dust not pres
0.24 mg/seed	negative	hive placed after bloom
0.24 mg/seed	negative	hive placed after bloom
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
156 mL per 50,000	negative	study reported that there were other plants in the area that are favored over the maize
/150 mL per 50,000 se	negative	study reported that there were other plants in the area that are favored over the maize
0 μg/kg	control	1 of 4 colonies collapsed at 23 weeks
1 (4wk)/20 (9wk) µg/l	positive	3 of 4 colonies collapsed at 19-23 weeks
1 (4wk)/ 40 (9wk) μg/	positive	4 of 4 colonies collapsed starting at 16 weeks
3 (4wk)/ 200 (9wk) μg/	positive	All colonies failed
5 (4wk)/ 400 (9wk) μg	positive	All colonies failed between 14 and 18 weeks
3-100 μg/kg	positive	duration of feeding declined
25 μg/kg	positive	decrease in consumption of food
0.3-0.8 L/ha	negative	not significant
0.5-5 ppb	negative	not significant
0.005 g a.i./m2	negative	not significant
50 µg/kg	positive	number of visits declined to 0 during phase 2
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
400 ppm	positive	high rate of apoptosis
2000 ng/larava	positive	eclosion rates significantly affected from 2000 up
4-8 μg/L	borderline	some changes but not in all endpoints
3.4 μM	borderline	partial agonist of nAChRs on AL neurones,
2.1 (sugar water)	negative	not significant
not stated	positive	acetylcholinesterase and carboxylesterase significantly decreased
.0325ng/bee	positive	AchE activity much higher
0.12-0.24 ng/bee	positive	AchE activity much higher
7 μg/kg	negative	not significant
0.08-125 ug/L	negative	no difference
48ug/kg	positive	lower food intake in treated group
200ppm	negative	significantly more dead than controls
10mg.l	positive	The AccGtpx-1 gene was induced after treatments with imidacloprid
1.25ng/bee	positive	significant staining observed
0.12-12 ng/bee	positive	A significant increase of CO staining
10-8-10-4 M	positive	increased cytochrome oxidase (CO) labelling within 30 min in all the structures analysed.
32 g a.i./ha	negative	not significant
0.002-0.02 mg/kg	negative	
110 µM	positive	potent inhibitors (IC50) 1-9 $\mu\text{M}$ ) of [3H]TCP binding to Apis head membranes,
10-30ng/bee	positive	virus replicated faster/dose dependent
10-30ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent

positive	virus replicated faster/dose dependent
positive	virus replicated faster/dose dependent
positive	supressed immune response
positive	agonist of acetylcholine receptor disrupts immune response
negative	not significant
positive	"Thiamethoxam by contact induced either a significant decrease of olfactory mem
negative	"0.01 ng/bee, honeybees spent significantly more time immobile
positive	affected immune related genes
positive	Imidacloprid had a greater effect as the acorns were much more atrophied
positive	acini declined by dose
positive	apoptosis of nerve cells confirmed and increased with dosage
positive	hypopharyngeal glands significantly smaller
positive	sublethal doses cause damage to brain and midgut
positive	100% mortality over two seasons
positive	87% mortality with shorter administration
positive	100% mortality over two seasons
positive	67% mortality with shorter administration
positive	57% mortality with shorter administration
positive	mortality declined when bees were exposed later
positive	mortality declined when bees were exposed later
positive	mortality declined when bees were exposed later
positive	mortality declined when bees were exposed later
positive	mortality declined when bees were exposed later
negative	low mortality if bees exposed 3 days later
positive	100%mortality at 0 hours aged residue
positive	87% mortality over two seasons for 1 hour residue
positive	74% mortality for 4 hour residue
positive	64% mortality for 8 hour residue
positive	41% mortality for 24 hour aged residues
positive	22% mortality for 48 hour aged residues
positive	15% mortality for 72 hour aged residues
positive	7.5% mortality for 120 hour aged residues
positive	mortality increased over time
positive	mortality significantly higher
positive	averaged 123 dead bees per colony at day 1
negative	no effect
negative	not significant
positive	97% mortality with 2 hours aged residue
positive	100% mortality with 8 hours aged residue
positive	100% mortality with 8 hours aged residue
positive	100% mortality with 8 hours aged residue
positive	increased from 14% to 19% in 2 hours
positive	33% mortality at 2 hours
	positive positive

0.20 mg a.i./ml	positive	100% mortality
0.100 mg a.i./ml	positive	100% mortality
150 g/100L H2O	positive	56% mortality 1 hour after contact
1.25 mg/seed	positive	100% mortality with brief dusting
0.1 mg/seed	positive	
0.1 mg/seed	positive	87% mortality with brief dusting
118-674 ng/bee	positive	100% mortality in high humidity starting at 20 minutes to 8 hours
30-3661 ng/bee	positive	100% mortality in high humidity
field exposure	positive	High mortality reported in 2012
field exposure	positive	High mortality reported in 2012
20 g a.i./ha	positive	100% mortality at 24 hours
20 g a.i./ha	positive	100% mortality at 2 hours
25 g a.i./ha	positive	50% mortality in 24 hours
1.25 mg/seed dust	negative	"Chemical analysis showed high quantities of neonicotinoid insecticide in dead bees
g/seed dust 30 min. e:	positive	50-97% mortality
(1.8) (ng/bee)	positive	mortality significantly higher
100-300 g a.i./ha	positive	Mortality increased as exposure and dosage increased
15-200 g a.i./ha	positive	Mortality increased as exposure and dosage increased
0.02%	positive	69% mortality at 72 hours
32 g a.i./ha	negative	
5.12 ug/m2	positive	mortality increased over time
5.12 ug/m2 x 3 hours	positive	mortality increased over time
150 g/100L H2O	positive	100% mortality at 9 hours
0.00583 ml/cm2	positive	100% mortality after 2.61 hours
0.025-0.1 lb a.i./acre	borderline	up to 19% mortality which is more than overwintering
0.5-2 g a.i./ha	positive	mortality increased with dosage
200 g/ha	positive	100% mortality after 330 minutes
0.00583 ml/cm2	positive	100% mortality after 1 hour
0.005-0.03 µg/bee	borderline	imidicloprid toxicity not affected by diet
150 g/100L H2O	positive	99% mortality at 24 hours
7.35 g a.i./ha20%	positive	mortality significantly higher
general exp.	positive	mortality increased over time
0.25 ml/L	positive	mortality 4 times higher
0.50 ml/L	positive	mortality 4 times higher
0.75 ml/L	positive	mortality 4 times higher
12.6 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
8-40ppb	positive	mortality significantly higher
68ppb	negative	Formula was adjusted by Abbott and then retested providing stated results
96ppb	positive	Formula was adjusted by Abbot
0.5-5.0 μg/lin syrup	negative	not significant
0.002-0.02 mg/kg	negative	
5x10-6-1.5x10-3 m/ml	positive	especially high mortality in bees with virus
5x10-6-1.5x10-3 m/ml	positive	highest mortality in younger bees
5x10-6-1.5x10-3 m/ml	positive	90% mortality
5x10-6-1.5x10-3 m/ml	positive	younger bees regurgitated but were damaged
5x10-6-1.5x10-3 m/ml	negative	In Malpighian tubules treated with insecticide a smaller basophilic was observed
48ng/g	negative	20% mortality compared to 15%
0.0005-0.05 %	positive	100% mortality at .03%
0.0005-0.05 %	positive	70% mortality at 300 minutes at lowest dose

0.0005-0.05 %	positive	90% mortality at .05%
2 µg/L	positive	70% increase in mortality in those with parasites
0.00583 ml/cm2	positive	100% mortality after 1.51 hours
.0325ng/bee	negative	abstract says positive for other markers
1000 nmol/l	positive	mortality significantly higher
1000 nmol/l	positive	mortality significantly higher
50 ng/μl 1mM verapar	borderline	significantly higher mortality
0.7-70 μg/l	positive	Highest mortality in bees infected with Nosema
3.55 ng a.i./L	negative	neurotocity determined
3.55 ng a.i./L	negative	
3.55 ng a.i./L	negative	study abstract says positive for all but one endpoint
0.1-1 ng/bee	negative	
48 µg/kg(ppb)	negative	Mortality did not increase
48ug/kg	negative	no significant difference in mortality
1.00.1-10.0 μg/L	positive	significant mortality in all groups
1.00.1-10.0 μg/L	positive	mortality at all levels
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	negative	not significant
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
1-1000ng/bee	positive	100% mortality starting at 200ng/bee
1-1000ng/bee	positive	toxic to all worker bees
0.727 ng/bee/d	positive	mortality significantly increased with time
(5x10 -9-5x10 -7) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 -9-5x10 -7) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 -9-5x10 -7) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 -9-5x10 -7) ng a	positive	100% mortality at 150 hours
0.7-70 μg/l	positive	highest mortality at 11 days
0.7-70 μg/kg	positive	mortality increase especially with nosema
150 g/100L H2O	positive	71% mortality after 1 hour, 100% mortality after 9 hours
51.2 ug/m2	borderline	comparing two pesticides
0.24-0.30 ng/bee	positive	hyperactivity - tremors - higher mortality
.0325ng/bee	negative	no significant difference in mortality
500 ng/kg	positive	Decrease in HPG acinal diameter with exposure duration.
32 g a.i./ha	negative	
0.0428 ng a.i./L diet	positive	sub-lethal doses cause organ damage while metabolizing the pesticide. Damage can reve
32 g a.i./ha	negative	
0.3-0.8 L/ha	negative	not significant
24 ng/larava	positive	pupation rates significantly affected
100-500 ppb	positive	significantly less active
100-500 ppb	positive	effects within 1 hour vanished after 30 hours
2.56-51.16	positive	but there were changes in gene expression
7 μg/kg	positive	disease progressed more rapidly in treated group

1.5-48 ug/kg	negative	not significant
30-240 ug/kg	positive	significantly lower food intake
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed to discrin
0.08-125 ug/L	negative	no difference

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165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
535	lab	imidicloprid	behavior/reflex	assumed oral
750	semi-field	clothianidin	mortality	contact
750	semi-field	clothianidin	colony parameter/strength	contact
750	semi-field	clothianidin	colony parameter/thermoregulation	contact
750	semi-field	clothianidin	colony parameter/behavior	contact
750	semi-field	clothianidin	colony parameter/flight	contact
884	semi-field	clothianidin	mortality	contact
1186	greenhouse	clothianidin	mortality	contact
788	lah	thiamethoxam	subletbal/biomarkers	contact
1923	semi-field	imidicloprid	behavior/foraging	contact and oral
1923	semi-field	imidicloprid	mortality	contact and oral
1709	lah	imidicloprid	mortality	contact corn tassels
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	clothianidin	mortality	contact corn tassels
1277	field	imidicloprid	colony parameter/collanse	contact foraging maize
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
7346	lah	thiamethoxam		contact/acetone sol
1/13	Cage	imidicloprid	mortality	contact/alfalfa
1/13	cage	imidicloprid	mortality	contact/alfalfa
1/13	Cage	imidicloprid	mortality	contact/alfalfa
1/13	cage	imidicloprid	mortality	contact/alfalfa
210	cage	imidicloprid	mortality	contact/alfalfa
276	Cage	imidicloprid	mortality	contact/alfalfa
7/67	field	imidicloprid	hebayior/foraging	contact/brassica
7407	field	imidicloprid	behavior/foraging	contact/brassica
7407	field	imidicloprid	behavior/foraging	contact/brassica
1/177	lah	thiamethovom	periavior/ioragilig	contact/citrus logues
1/170	lau Iah	thiamethoyam	mortality	contact/citrus leaves
147Z	lau Ish	thismotheyer	mortality	uniaci/citius leaves
1300	IdD field		mortality	macy contaminated surra
062	Tield	ciotnianidin	mortality	contact/dust

662	field	imidicloprid	mortality	
662	field	thiamethoxam	mortality	
865	field	clothianidin	mortality	
865	field	imidicloprid	mortality	
486	desk	clothianidin	mortality	CO
486	desk	anidin and thiameth	mortality	CO
7260	lab	imidicloprid	mortality	
7260	lab	clothianidin	mortality	
1213	lab	imidicloprid	mortality	con
895	field	combination of all	colony parameters	СС
915	field	imidicloprid	behavior/flower visits	СС
920	field	imidicloprid	colony parameter/survival	СС
978	field	clothianidin	mortality	СС
978	field	clothianidin	mortality	СС
1164	field	imidicloprid	behavior/activity	СС
1164	field	thiamethoxam	behavior/activity	СС
1171	field	clothianidin	mortality	СС
1264	field	imidicloprid	colony parameters	СС
1370	field	thiamethoxam	mortality	СС
1370	field	thiamethoxam	mortality	СС
1644	field	imidicloprid	mortality	СС
1532	field	clothianidin	colony parameter/weight	conta
1532	field	clothianidin	honey production	conta
1532	field	clothianidin	mortality	conta
1532	field	clothianidin	offspring production	conta
1532	field	clothianidin	Over-wintering	conta
1690	field	thiamethoxam	Behavior/returning bees	contac
1690	field	thiamethoxam	Behavior/returning bees	contac
750	lab	clothianidin	mortality	С
750	lab	clothianidin	mortality	c
1306	lab	thiamethoxam	mortality	c
545	lab	thiamethoxam	mortality	C
7556	semi-field	imidicloprid	mortality	cont
616	lab	imidicloprid	behavior/avoidance	со
1011	semi-field	clothianidin	mortality	со
1011	semi-field	clothianidin	behavior	со
1259	greenhouse	thiamethoxam	mortality	со
545	lab	thiamethoxam	mortality	(
557	lab	clothianidin	immunity/immune response	С
557	lab	clothianidin	immunity/immune response	С
557	lab	clothianidin	immunity/deformed wing virus	С
557	lab	imidicloprid	immunity/deformed wing virus	С
557	lab	clothianidin	immunity/deformed wing virus	С
557	lab	imidicloprid	immunity/deformed wing virus	С
557	lab	clothianidin	immunity/deformed wing virus	C
557	lab	imidicloprid	immunity/deformed wing virus	с
557	lab	clothianidin	immunity/deformed wing virus	С
557	lab	imidicloprid	immunity/deformed wing virus	с
859	lab	imidicloprid	mortality	с
1314	lab	thiamethoxam	behavior	с
557 557 859 1314	lab lab lab lab	ciothianidin imidicloprid imidicloprid thiamethoxam	immunity/deformed wing virus immunity/deformed wing virus mortality behavior	

contact/dust contact/dust contact/dust contact/dust ntact/dust/corn ntact/dust/corn contact/film contact/film ntact/filter paper ontact/foraging act/foraging canola act/foraging canola act/foraging canola act/foraging canola act/foraging canola ct/foraging mustard ct/foraging mustard contact/leaves contact/leaves contact/leaves ontact/leaves tact/leaves alfalfa ontact/oral/dust ontact/oral/dust ontact/oral/dust ontact/oral/dust contact/spray contact/topical contact/topical

1314	lab	thiamethoxam	chronic/probiscus extension	contact/topical
1314	lab	thiamethoxam	locomotor	contact/topical
1314	lab	thiamethoxam	sugar respons3	contact/topical
1314	lab	thiamethoxam	learning	contact/topical
1408	lab	thiamethoxam	behavior/PEReflex	contact/topical
2060	lab	imidicloprid	behavior/gustatory threshold	contact/topical
2060	lab	imidicloprid	behavior/locomotion	contact/topical
2060	lab	imidicloprid	behavior/PER	contact/topical
2112	lab	imidicloprid	behavior/PER	contact/topical
1306	lab	thiamethoxam	mortality	contaminated diet
2060	lab	imidicloprid	histochemestry	cranial injection
1419	lab	imidicloprid	electrophysiology	direct to antenae
2207	lab	imidicloprid	/Densitometric analysis for AL and mu	direct to brain
1085	field	thiamethoxam	mortality	dust/corn
1180	cage	clothianidin	mortality	field exp./potato
689	field	clothianidin	colony parameters	field exposure
1687	Tunnel	thiamethoxam	hebayior/foraging	field exposure
1687	Tunnel	thiamethoxam	hehavior/foraging	field exposure
2183	field	imidicloprid	colony parameters/weight gain	field exposure
2103	field	imidicloprid	Jony parameter/number returning be	field exposure
2103	field	imidicloprid	colony parameters/pollen carrying	field exposure
2105	field	imidicloprid	colony parameters wisits to flowers	field exposure
2103	field	imidicloprid	colony parameters/visits to nowers	field exposure
2105	field	imidicloprid	colony parameter/colony weight	field exposure
2105	field	imidicloprid	colony parameter/colony weight	field exposure
2103	field	imidicloprid	colony parameter/colony growth	field exposure
2183	field	imidicioprid	colony parameter/brood nest size	field exposure
2183	field	imidicioprid	colony parameter/comb size	field exposure
2183	field	imidicioprid	Siony parameter/number returning be	field exposure
2183	tield	imidicioprid	colony parameter/pollen carrying	field exposure
/533	tent	• • • • • • • • • • • • •	colony parameters/varied	field exposure
143	cage	imidicloprid	behavior/foraging	field exposure/apple
143	cage	imidicloprid	behavior/foraging	field exposure/dandelion
533	field	thiamethoxam	behavior/foraging	field foraging
533	field	thiamethoxam	behavior/foraging	field foraging
680	field	thiamethoxam	behavior/flower visits	field foraging
697	lab	imidicloprid	mortality	film method
697	lab	imidicloprid	mortality	film method
697	lab	imidicloprid	mortality	film method
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
1943	lab	imidicloprid	imidicloprid binding site	head membranes
753	lab	imidicloprid	capped brood rate	into laraval combs

753	lab	imidicloprid	pupation rate	into laraval combs
753	lab	imidicloprid	eclosion rate	into laraval combs
753	lab	imidicloprid	behavior/probosis extenion/PER	into laraval combs
690	field	clothianidin	colony parameters/collapse	maize flower foraging
690	field	imidicloprid	colony parameters/collapse	maize flower foraging
654	lab	imidicloprid	acetylcholinesterase activity/brain	not stated
654	lab	imidicloprid	acetylcholinesterase activity/brain	not stated
1803	field	imidicloprid	behavior/number foraging	ora/sugar water
529	lab	imidicloprid	morphology/apoptosis nerve cells	oral
533	lab	thiamethoxam	behavior/foraging	oral
534	lab	imidicloprid	behavior/coordination	oral
823	lab	imidicloprid	behavior/foraging and waggle dance	oral
823	lab	imidicloprid	behavior/PEReflex	oral
783	lab	imidicloprid	genetic change/larval gene expressior	n oral formula
818	field	imidicloprid	colony parameters/collapse	l supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	l supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	l supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	l supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	l supplemental for overwir
863	field	imidicloprid	colony parameter	oral supplements
0	lab	clothianidin	behavior/arching and wing block	oral.guttation fluid
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid
0	lab	imidicloprid	behavior/arching and wing block	oral.guttation fluid
0	lab	clothianidin	behavior/arching and wing block	oral.guttation fluid
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid
2159	lab	imidicloprid	mortality	oral/diet
2159	lab	imidicloprid	behavior/PER	oral/diet
758	lab	imidicloprid	mortality	oral/food
758	lab	imidicloprid	mortality	oral/food
1153	lab	imidicloprid	mortality/neurotoxicy	oral/food
1760	field	imidicloprid	behavior/activity	oral/food
1760	field	imidicloprid	mortality	oral/food
1760	field	imidicloprid	colony parameter/weight gain	oral/food
1760	field	imidicloprid	behavior/pollen carrying	oral/food
1760	field	imidicloprid	brood development	oral/food
2139	semi-field	imidicloprid	behavior/foraging	oral/food/honey
2139	semi-field	imidicloprid	honey production	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/weight gain	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/offspring	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	mortality	oral/food/honey
1236	lab	thiamethoxam	behavior/arching and wing block	oral/guttation fluid
580	lab	imidicloprid	behavior/learning	oral/honey
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide

1005	lab	imidicloprid	development/cell death	oral/larval food
1074	cage	imidicloprid	mortality	oral/pollen
1074	cage	imidicloprid	chronic food consu.	oral/pollen
1075	lab	imidicloprid	behavior/navigation	oral/pollen
1075	lab	imidicloprid	behavior/PEReflex	oral/pollen
612	lab	imidicloprid	ology/Development of hypopharyngea	oral/pollen/sugar water
612	lab	imidicloprid	electrophysiology	oral/pollen/sugar water
1970	lab	imidicloprid	mortality	oral/solution
1970	lab	imidicloprid	mortality	oral/solution
1970	lab	imidicloprid	mortality	oral/solution
143	cage	imidicloprid	avoidance/food intake	oral/sugar water
504	lab	imidicloprid	mortality	oral/sugar water
504	lab	imidicloprid	molecular response/gene expression	oral/sugar water
505	lab	imidicloprid	behavior/homing	oral/sugar water
505	lab	clothianidin	behavior/homing	oral/sugar water
545	lab	thiamethoxam	mortality	oral/sugar water
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water
557	lab	imidicloprid	immunity/deformed wing virus	oral/sugar water
601	cage	clothianidin	mortality	oral/sugar water
601	cage	imidicloprid	enzymes/aCHe activity	oral/sugar water
601	cage	imidicloprid	mortality/hyperactivity	oral/sugar water
601	cage	clothianidin	enzymes/aCHe activity	oral/sugar water
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water
603	lab	imidicloprid	brain morphology	oral/sugar water
622	lab	imidicloprid	behavior/reflex	oral/sugar water
622	lab	mix - imidicloprid	behavior/reflex	oral/sugar water
635	lab	imidicloprid	mortality	oral/sugar water
635	lab	mix - imidicloprid	mortality	oral/sugar water
635	lab	imidicloprid	behavior/reflex	oral/sugar water
635	lab	mix - imidicloprid	behavio/reflex	oral/sugar water
744	lab	imidicloprid	feeding rate	oral/sugar water
744	lab	imidicloprid	survival/longevity	oral/sugar water
820	lab	imidicloprid	behavior/distance travelled	oral/sugar water
820	lab	imidicloprid	behavior/interaction	oral/sugar water
820	lab	imidicloprid	behavior/time in food zone	oral/sugar water
833	field	thiamethoxam	behavior/homing rate	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	, imidicloprid	behavior/homing	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	clothianidin	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	, imidicloprid	behavior/homing rates	oral/sugar water
868	field	imidicloprid	behavior/homing	oral/sugar water
868	field	imidicloprid	behavior/foraging rate	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging/trip duration	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/feeding	oral/sugar water
			. 0	

935	lab	imidicloprid	mortality	0
984	lab	imidicloprid	behavior/reflex/PER	0
984	lab	imidicloprid	behavior/reflex	0
1023	lab	imidicloprid	morphology/acini diameter	0
1107	lab	imidicloprid	genetic/change	0
1118	lab	imidicloprid	ethyl oleate production	0
1133	lab	imidicloprid	mortality	0
1133	lab	imidicloprid	immunity/Total haemolymph count	0
1312	field	imidicloprid	mortality	0
1312	field	imidicloprid	colony parameter	0
1312	field	imidicloprid	mortality	0
1312	field	imidicloprid	colony parameter	0
1312	field	imidicloprid	mortality	0
1314	lab	thiamethoxam	mortality	0
1314	lab	thiamethoxam	behavior	0
1314	lab	thiamethoxam	behavior	0
1314	lab	thiamethoxam	behavior	0
1314	lab	thiamethoxam	behavior	0
1358	field	imidicloprid	behavior/foraging	0
1400	lab	imidicloprid	behavior/foraging	0
1400	lab	imidicloprid	mortality	0
1408	lab	thiamethoxam	behavior/locomotion	0
1708	cage	imidicloprid	mortality	0
1708	cage	imidicloprid	food intake	0
1708	cage	imidicloprid	behavior/foraging	0
1708	cage	imidicloprid	behavior/learning	0
1801	semi-field	imidicloprid	behavior/foraging	0
1802	lab	mix imidicloprid	mortality	0
1802	lab	mix imidicloprid	mortality	0
1836	lab	imidicloprid	behavior/reflex	0
1836	semi-field	imidicloprid	behavior/learning	0
1839	lab	imidicloprid	behavior/symptoms	0
1845	lab	imidicloprid	behavior/PER	0
1845	lab	imidicloprid	histochemestry	0
1888	lab	imidicloprid	effects of long term exposure	0
1921	lab	imidicloprid	sublethal/activities	0
1921	lab	imidicloprid	sublethal/activities	0
1922	field	imidicloprid	behavior/foragaing	0
1934	field	imidicloprid	וץ parameters/summer dev/winter sur	0
1949	lab	imidicloprid	behavior/PER	0
1949	lab	metabolite of im.	behavior/PER	0
1949	lab	metabolite of im.	behavior/PER	0
1949	lab	metabolite of im.	behavior/PER	0
1949	lab	metabolite of im.	behavior/PER	0
1949	lab	metabolite of im.	behavior/PER	0
1954	lab	imidicloprid	mortality	0
1954	lab	imidicloprid	mortality	0
1954	lab	imidicloprid	mortality	0
1954	lab	imidicloprid	mortality	0
1954	lab	imidicloprid	sublethal/food intake	0

ral/sugar water ral/sugar water

1954	lab	imidicloprid	sublethal/food intake
1954	lab	imidicloprid	behavior/PER
1954	lab	imidicloprid	behavior/PER
1954	lab	metabolite of im.	behavior/PER
1954	lab	imidicloprid	behavior/PER
2095	lab	imidicloprid	behavior/PER
2096	lab	imidicloprid	mortality
2096	lab	metabolite of im.	mortality
2096	lab	metabolite of im.	mortality
2096	lab	metabolite of im.	mortality
2096	lab	metabolite of im.	mortality
2096	lab	metabolite of im.	mortality
2096	lab	metabolite of im.	mortality
2157	field	imidicloprid	, behavior/orientation/foraging
2157	field	imidicloprid	behavior/orientation/foraging
2159	cage	imidicloprid	behavior/flight
2159	cage	imidicloprid	behavior/learning
2160	lab	imidicloprid	mortality
2160	lab	imidicloprid	mortality
2162	Tunnel	imidicloprid	ony parameters/visits to feeding static
2162	Tunnel	imidicloprid	colony parameters/food intake
2162	Tunnel	imidicloprid	colony parameters/feeding duration
7242	lab	thiamethoxam	mortality
7274	lab	thiamethoxam	Morphology/histochemistry/
7302	lab	thiamethoxam	mortality
7302	lab	thiamethoxam	mortality
7302	lab	thiamethoxam	mortality
7302	lab	thiamethoxam	mortality
7352	field	thiamethoxam	behavior/foraging
7352	field	thiamethoxam	behavior/returning bees
7352	field	thiamethoxam	Behavior/returning bees
7390	lab	imidicloprid	mortality
7390	lab	imidicloprid	logy/Development of hypopharyngeal
7391	lab	imidicloprid	mortality
7391	lab	imidicloprid	sub-lethal/disease status
7532	field	imidicloprid	behavior/foraging
500	lab	thiamethoxam	organ damage
521	lab	imidicloprid	behavior/feeding
1408	lab	thiamethoxam	behavior/locomotion/learning
1306	lab	thiamethoxam	mortality
1924	field	imidicloprid	colony parameters
1924	field	imidicloprid	colony parameters
1924	field	imidicloprid	colony parameters
1924	field	imidicloprid	colony parameters
1924	field	imidicloprid	colony parameters
1924	field	imidicloprid	colony parameters
1924	field	imidicloprid	colony parameters
1924	field	imidicloprid	colony parameters
1924	field	imidicloprid	colony parameters
7303	semi-field	clothianidin	mortality
		0.00	

oral/sugar water oral/syrup oral/syrup oral/topical spray sunflower/field sunflower/field sunflower/field sunflower/field sunflower/field sunflower/field sunflower/field sunflower/field sunflower/field talc/contact

7303	semi-field	clothianidin	colony parameter/strength	talc/contact
1408	lab	thiamethoxam	behavior/reflex	topical contact
1076	field	imidicloprid	colony parameter/collapse	unknown origin
397	lab	imidicloprid	binding to acetylcholine receptor	

25.0 g a.i./ha	positive	100% mortality over two seasons
25.0 g a.i./ha	positive	87% mortality with shorter administration
25.0 g a.i./ha	positive	100% mortality over two seasons
25.0 g a.i./ha	positive	67% mortality with shorter administration
25.0 g a.i./ha	positive	57% mortality with shorter administration
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	negative	low mortality if bees exposed 3 days later
25.0 g a.i./ha	positive	100%mortality at 0 hours aged residue
25.0 g a.i./ha	positive	87% mortality over two seasons for 1 hour residue
25.0 g a.i./ha	positive	74% mortality for 4 hour residue
25.0 g a.i./ha	positive	64% mortality for 8 hour residue
25.0 g a.i./ha	positive	41% mortality for 24 hour aged residues
25.0 g a.i./ha	positive	22% mortality for 48 hour aged residues
25.0 g a.i./ha	positive	15% mortality for 72 hour aged residues
25.0 g a.i./ha	positive	7.5% mortality for 120 hour aged residues
1/5 of LD50	positive	impaired sucrose metabolism
5.12 ug/m2	positive	mortality increased over time
5.12 ug/m2	positive	colony strength affected
5.12 ug/m2	negative	no change in thermoregulation
5.12 ug/m2	negative	no significant change
5.12 ug/m2	positive	flight activity higher in treated group
1 g a.i./ha (x≤160 µm)	positive	mortality significantly higher
unknown	positive	averaged 123 dead bees per colony at day 1
2.56-51.16	positive	but there were changes in gene expression
0.6-14 g a.i./ha	positive	significant foragaging impairment at higher dosages
0.6-14 g a.i./ha	negative	no effect
1.6/2,5 g a.i. /kg seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
dust	negative	"However, additional studies are needed to better understand possible synergistic mecha
7.35 g a.i./ha50%	positive	foraging behavior significantly impaired
not stated	positive	acetylcholinesterase and carboxylesterase significantly decreased
.02828kg a.i./ha	positive	97% mortality with 2 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
.168kg a.i./ha	positive	increased from 14% to 19% in 2 hours
.11kg a.i./ha	positive	33% mortality at 2 hours
140 ml/ha	negative	not significant
168 ml/ha	negative	not significant
196 ml/ha	negative	not significant
0.20 mg a.i./ml	positive	100% mortality
0.100 mg a.i./ml	positive	100% mortality
150 g/100L H2O	positive	56% mortality 1 hour after contact
1.25 mg/seed	positive	100% mortality with brief dusting

positive	
positive	87% mortality with brief dusting
positive	100% mortality in high humidity starting at 20 minutes to 8 hours
positive	100% mortality in high humidity
positive	High mortality reported in 2012
positive	High mortality reported in 2012
positive	100% mortality at 24 hours
positive	100% mortality at 2 hours
positive	50% mortality in 24 hours
negative	"However, the risk exposure of bee colonies on adverse impact
positive	number of visits to flowers reduced
positive	higher mortality, higher queen mortality and lower hive weight
negative	"Chemical analysis showed high quantities of neonicotinoid
positive	50-97% mortality
positive	Activity less with exposure
positive	Activity less with exposure
positive	mortality significantly higher
negative	not significant
positive	Mortality increased as exposure and dosage increased
positive	Mortality increased as exposure and dosage increased
positive	69% mortality at 72 hours
negative	not significant
negative	not significant
negative	
negative	
negative	
negative	difference not considered significant
positive	number of returning bees greatly affected
positive	mortality increased over time
positive	mortality increased over time
positive	100% mortality at 9 hours
positive	100% mortality after 2.61 hours
orderline	up to 19% mortality which is more than overwintering
negative	not significant
positive	mortality increased with dosage
positive	risk greatest at edge of field
positive	100% mortality after 330 minutes
positive	100% mortality after 1 hour
positive	supressed immune response
positive	agonist of acetylcholine receptor disrupts immune response
positive	virus replicated faster/dose dependent
positive	virus replicated faster/dose dependent
positive positive	virus replicated faster/dose dependent virus replicated faster/dose dependent
positive positive orderline	virus replicated faster/dose dependent virus replicated faster/dose dependent imidicloprid toxicity not affected by diet
	positive pos

0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeybees after
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed to discrin
0.1-1 ng/bee	positive	"Thiamethoxam by contact induced either a significant decrease of olfactory mem
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
5 ng/bee	positive	significant loss of sensitivity
1.25-5 ng/bee	positive	significant increase in immobility and loss of coordination
1.25ng/bee	positive	significant impairment of PER function
0.1-10 ng/bee	positive	significant impairment of PER function
150 g/100L H2O	positive	99% mortality at 24 hours
1.25ng/bee	positive	significant staining observed
3.4 µM	borderline	partial agonist of nAChRs on AL neurones,
10-8-10-4 M	positive	increased cytochrome oxidase (CO) labelling within 30 min in all the structures analysed.
7.35 g a.i./ha20%	positive	mortality significantly higher
general exp.	positive	mortality increased over time
DL, 5000x diluted -at 2	negative	"The results indicated that clothianidin spraying of the rice field increased the mortality
30ml/hl - 12 ± 0.5 hl/h	positive	foraging behavior significantly impaired
20ml/hl - 12 ± 0.5 hl/h	positive	sharp decline in foraging followed by partial improvement
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	borderline	some changes but not in all endpoints
0.005 g a.i./m2	negative	not significant
0.112 kg(a.i.)/ ha	negative	no significant difference
0.112 kg(a.i.)/ ha	positive	60% reduction in foraging
1/10 LD50	positive	significant reduction of motor coordination
1/50 LD50	positive	return rate significantly lowered
र insecticide/20L of wa	positive	65% mortality with brief dusting
0.25 ml/L	positive	mortality 4 times higher
0.50 ml/L	positive	mortality 4 times higher
0.75 ml/L	positive	mortality 4 times higher
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
110 μM	positive	potent inhibitors (IC50) 1-9 $\mu$ M) of [3H]TCP binding to Apis head membranes,
24 ng/larava	positive	signficantly different than control. Most removed by nurse bees

24 ng/larava	positive	pupation rates significantly affected
2000 ng/larava	positive	eclosion rates significantly affected from 2000 up
0.04 ng/larva	positive	significant olfactory impairment dose dependent
156 mL per 50,000	negative	study reported that there were other plants in the area that are favored over the maize
/150 mL per 50,000 se	negative	study reported that there were other plants in the area that are favored over the maize
295 nM	positive	inhibited ACHe response
200 nM	positive	inhibited ACHe response
45.9 g a.i./ha	negative	not significant
9.9ng/bee	positive	apoptosis of nerve cells confirmed and increased with dosage
1/5 of LD50	positive	could not discriminate between food and non food sources
1/100 of LD50	positive	loss of coordination
24 ppb	positive	no difference in foragaging but significant difference in dance
24-241 ppb	positive	Fewer PER responses that were further reduced by dose increase
200ppm	negative	significantly more dead than controls
0 μg/kg	control	1 of 4 colonies collapsed at 23 weeks
1 (4wk)/20 (9wk) µg/l	positive	3 of 4 colonies collapsed at 19-23 weeks
1 (4wk)/ 40 (9wk) μg/	positive	4 of 4 colonies collapsed starting at 16 weeks
} (4wk)/ 200 (9wk) μg	positive	All colonies failed
5 (4wk)/ 400 (9wk) µg	positive	All colonies failed between 14 and 18 weeks
5-20 ppb	positive	difficulty when exposed to other toxins as compared to controls
23.3 mg/L	positive	wing block within 2 to 9 minutes
23.3 mg/L	positive	more toxic than clothianidin
6.25-100 mg/L	positive	wing block within 2 to 9 minutes
23.3 mg/L	positive	dose dependent
1.5-100 mg/L	positive	wing block within 1 hour
8-40ppb	positive	mortality significantly higher
4-40ppb	positive	significant impairment of PER function
68ppb	negative	Formula was adjusted by Abbott and then retested providing stated results
96ppb	positive	Formula was adjusted by Abbot
500 ng/kg	positive	Decrease in HPG acinal diameter with exposure duration.
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	positive	significant increase in pollen carrying
0.5-5.0 μg/lin syrup	positive	significant difference in capped brood
0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
0.002-0.02 mg/kg	negative	
47 mg/L	positive	wing block within 2 to 6 minutes
0.1ug/bee	positive	learning and memory significantly impaired
5x10-6-1.5x10-3 m/ml	positive	especially high mortality in bees with virus
5x10-6-1.5x10-3 m/ml	positive	highest mortality in younger bees
5x10-6-1.5x10-3 m/ml	positive	90% mortality
5x10-6-1.5x10-3 m/ml	positive	younger bees regurgitated but were damaged
5x10-6-1.5x10-3 m/ml	negative	In Malpighian tubules treated with insecticide a smaller basophilic was observed

400 ppm	positive	high rate of apoptosis
48ng/g	negative	20% mortality compared to 15%
48ng/g	positive	consumption of treated pollen significantly less
48ppb	positive	navigation significantly impaired
48ppb	positive	not significant
2.1 (sugar water)	positive	hypopharyngeal glands significantly smaller
2.1 (sugar water)	negative	not significant
0.0005-0.05 %	positive	100% mortality at .03%
0.0005-0.05 %	positive	70% mortality at 300 minutes at lowest dose
0.0005-0.05 %	positive	90% mortality at .05%
10 ppm	positive	85% fewer feeding visits
2 μg/L	positive	70% increase in mortality in those with parasites
2 μg/L	positive	affected immune related genes
7.5-11.25 ng/bee	positive	unable to reach the hive
2.5 ng/bee	positive	longer flight paths
0.00583 ml/cm2	positive	100% mortality after 1.51 hours
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
.0325ng/bee	negative	abstract says positive for other markers
.0325ng/bee	positive	AchE activity much higher
0.24-0.30 ng/bee	positive	hyperactivity - tremors - higher mortality
0.12-0.24 ng/bee	positive	AchE activity much higher
.0325ng/bee	negative	no significant difference in mortality
0.809-8.09 ng/bee	positive	apoptosis of brain cells confirmed
1.8ng/bee	negative	not significant
1.8ng/bee	negative	not significant
1000 nmol/l	positive	mortality significantly higher
1000 nmol/l	positive	mortality significantly higher
1000 nmol/l	positive	significant impairment of all functions
1000 nmol/l	positive	significant impairment of all functions
0.08-125 ug/L	negative	no difference
0.08-125 ug/L	negative	no difference
50-500 ppb	borderline	difference not considered significant
50-500 ppb	positive	lower dose no effect/ higher dose strong effect
50-500 ppb	positive	less interaction dose dependent
1.34 ng/bee	positive	significant reduction in homing up to 31% failed to return to hive when hive regularly tree
0.15-6ng/bee	positive	number of feeder visits decreased by up to 98%
0.15-6ng/bee	positive	at 3ng, reduced mobility observed
0.15-6ng/bee	positive	trip duration increased by 50% to 130%
0.15-6ng/bee	positive	time spent at feeder increased up to 47%
0.15-6ng/bee	positive	flight time to feeder increased up to 241%
0.15-6ng/bee	positive	flight time to hive increased up to 210%
0.15-6ng/bee	positive	intervals between feedings increased by 33% up to 993% respectively
0.15-6ng/bee	positive	80% fewer bees returned. Demonstrated distended bellies, legs shaking, death
0.5-2 ng/bee	positive	feeder visits reduced significantly
0.5-2 ng/bee	positive	duration of trips significantly affected
0.5-2 ng/bee	positive	time spent at feeder increased by up to 100%
0.5-2 ng/bee	positive	duration of trips significantly affected
1.5-3 ng/bee	positive	intervals between flights significantly increased
1.5-3 ng/bee	positive	time in hive increased

50 ng/μl 1mM verapai	borderline	significantly higher mortality
0.3-0.6 ng/bee	positive	PER significantly affected
0.3-0.6 ng/bee	negative	not significant
1 ppb	positive	acini declined by dose
10mg.l	positive	The AccGtpx-1 gene was induced after treatments with imidacloprid
7 μg/kg	negative	not significant
0.7-70 μg/l	positive	Highest mortality in bees infected with Nosema
0.7-70 μg/l	negative	not significant
3.55 ng a.i./L	negative	neurotocity determined
3.55 ng a.i./L	negative	"Our observations point towards decays of overall colony vitality for several hives
3.55 ng a.i./L	negative	
3.55 ng a.i./L	negative	
3.55 ng a.i./L	negative	study abstract says positive for all but one endpoint
0.1-1 ng/bee	negative	
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeybees after
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed to discrin
0.1-1 ng/bee	negative	"Thiamethoxam by contact induced either a significant decrease of olfactory mem
50-6000 μg/l	positive	At concentrations >1200 $\mu$ g/l, all bees showed abnormal foraging behaviour.
48 μg/kg(ppb)	negative	But bees took significantly longer to consume sugar water
48 μg/kg(ppb)	negative	Mortality did not increase
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
48ug/kg	negative	no significant difference in mortality
48ug/kg	positive	lower food intake in treated group
48ug/kg	positive	significantly less foraging behavior in treated group
48ug/kg	borderline	learning impaired but not significant
6 μg/kg	positive	significant difference in activity that was dose and time dependent
1.00.1-10.0 μg/L	positive	significant mortality in all groups
1.00.1-10.0 μg/L	positive	mortality at all levels
24 μg/kg	positive	PER significantly affected
24 μg/kg	positive	foraging behavior significantly impaired
20-50 μg/kg	positive	hyperactivity - tremors - higher mortality
12 ng/bee	positive	significant decrease in performance
0.12-12 ng/bee	positive	A significant increase of CO staining
4-8 μg/L	borderline	some changes but not in all endpoints
100-500 ppb	positive	significantly less active
100-500 ppb	positive	effects within 1 hour vanished after 30 hours
100-1000 ppb	positive	100% mortality after 24 hours at higher dosage
0.5-5 ppb	negative	not significant
0.1-1 ng/bee	positive	significant impairment of PER function
1ng/bee	negative	not significant
1ng/bee	negative	testing use of metabolite
1ng/bee	negative	testing use of metabolite
1ng/bee	negative	testing use of metabolite
10.1-10ng/bee	positive	significant impairment of PER function
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	negative	not significant
1.5-48 ug/kg	negative	not significant

30-240 ug/kg	positive	significantly lower food intake
60-240 ug/kg	positive	significant impairment of PER function
48 ug/kg	positive	significant impairment of PER function
7.5-240 ug/kg	negative	not significant
1.5-96 ug/kg	positive	significant impairment of PER function
1.25-20 ng/bee	positive	significant impairment of PER function
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
50ppb	positive	flight impaired
50ppb	positive	olafactory discrimination fell by 50% but recovered
1-1000ng/bee	positive	100% mortality starting at 200ng/bee
1-1000ng/bee	positive	toxic to all worker bees
50 μg/kg	positive	number of visits declined to 0 during phase 2
25 μg/kg	positive	decrease in consumption of food
3-100 μg/kg	positive	duration of feeding declined
0.727 ng/bee/d	positive	mortality significantly increased with time
).0428-0.428 ng a.i./µ	positive	sublethal doses cause damage to brain and midgut
(5x10 -9-5x10 -7) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 -9-5x10 -7) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 -9-5x10 -7) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 -9-5x10 -7) ng a	positive	100% mortality at 150 hours
1-2 ng/bee	positive	significant reduction in number of trips
1-2 ng/bee	positive	time to return significantly higher
1-2 ng/bee	positive	number returning declined significiantly
0.7-70 μg/l	positive	highest mortality at 11 days
0.7-70 μg/l	positive	Imidacloprid had a greater effect as the acorns were much more atrophied
0.7-70 μg/kg	positive	mortality increase especially with nosema
7 μg/kg	positive	disease progressed more rapidly in treated group
20-100 ppb	positive	mortality increased with dosage
0.0428 ng a.i./L diet	positive	sub-lethal doses cause organ damage while metabolizing the pesticide. Damage can reve
125 μg/L	negative	not significant
0.1-1 ng/bee	negative	THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY REPORTED TI
150 g/100L H2O	positive	71% mortality after 1 hour, 100% mortality after 9 hours
0.24 mg/seed	negative	hives were placed in field when flowers bloomed not when planted so seed dust not pres
0.24 mg/seed	negative	hive placed after bloom
0.24 mg/seed	negative	hive placed after bloom
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
51.2 ug/m2	borderline	comparing two pesticides

positive	high mortality and colony strength decline
negative	
positive	colonies contaminated by unknown source of neonics.
positive	Strong binding
	positive negative positive positive

chanisms of mortality, such as pathogens, to better quantify their synergistic effect to honey bee colony heal

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915	field	imidicloprid	behavior/flower visits	contact/foraging
1644	field	imidicloprid	mortality	contact/foraging
978	field	clothianidin	mortality	contact/foraging
978	field	clothianidin	mortality	contact/foraging
1171	field	clothianidin	mortality	contact/foraging
143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
601	cage	clothianidin	mortality	oral/sugar water
601	cage	imidicloprid	enzymes/aCHe activity	oral/sugar water
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water
326	cage	imidicloprid	mortality	contact/alfalfa
319	cage	imidicloprid	mortality	contact/alfalfa
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
1970	lab	imidicloprid	mortality	oral/solution
1970	lab	imidicloprid	mortality	oral/solution
1970	lab	imidicloprid	mortality	oral/solution
2139	semi-field	imidicloprid	behavior/foraging	oral/food/honey
2139	semi-field	imidicloprid	honey production	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/weight gain	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/offspring	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	mortality	oral/food/honey
1164	field	imidicloprid	behavior/activity	contact/foraging
1164	field	thiamethoxam	behavior/activity	contact/foraging
7533	tent		colony parameters/varied	field exposure
859	lab	imidicloprid	mortality	contact/topical
545	lab	thiamethoxam	mortality	contact/leaves
545	lab	thiamethoxam	mortality	contact/spray
545	lab	thiamethoxam	mortality	oral/sugar water
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
7556	semi-field	imidicloprid	mortality	contact/leaves alfalfa
753	lab	imidicloprid	behavior/probosis extenion/PER	into laraval combs
500	lab	thiamethoxam	organ damage	oral/syrup
7274	lab	thiamethoxam	Morphology/histochemistry/	oral/sugar water
744	lab	imidicloprid	feeding rate	oral/sugar water
744	lab	imidicloprid	survival/longevity	oral/sugar water
2096	lab	imidicloprid	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water

818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
662	field	imidicloprid	mortality	contact/dust
662	field	thiamethoxam	mortality	contact/dust
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1314	lab	thiamethoxam	mortality	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	contact/topical
1314	lab	thiamethoxam	chronic/probiscus extension	contact/topical
1314	lab	thiamethoxam	locomotor	contact/topical
1314	lab	thiamethoxam	sugar respons3	contact/topical
1314	lab	thiamethoxam	learning	contact/topical
1408	lab	thiamethoxam	behavior/locomotion	oral/sugar water
1408	lab	thiamethoxam	behavior/PEReflex	contact/topical
1408	lab	thiamethoxam	behavior/locomotion/learning	oral/topical
1408	lab	thiamethoxam	behavior/reflex	topical contact
1949	lab	imidicloprid	behavior/PER	oral/sugar water
2112	lab	imidicloprid	behavior/PER	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water
557	lab	imidicloprid	immunity/deformed wing virus	oral/sugar water
143	cage	imidicloprid	behavior/foraging	field exposure/dandelion
143	cage	imidicloprid	behavior/foraging	field exposure/apple
601	cage	clothianidin	enzymes/aCHe activity	oral/sugar water
1845	lab	imidicloprid	histochemestry	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/homing	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	clothianidin	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/homing rates	oral/sugar water
580	lab	imidicloprid	behavior/learning	oral/honey
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
601	cage	imidicloprid	mortality/hyperactivity	oral/sugar water
697	lab	imidicloprid	mortality	film method

984	lab	imidicloprid	behavior/reflex/PER	oral/sugar water
984	lab	imidicloprid	behavior/reflex	oral/sugar water
2183	field	imidicloprid	colony parameters/weight gain	field exposure
2183	field	imidicloprid	olony parameter/number returning be	field exposure
2183	field	imidicloprid	colony parameters/pollen carrying	field exposure
2183	field	imidicloprid	colony parameters/visits to flowers	field exposure
2183	field	imidicloprid	pollination/fruit set	field exposure
697	lab	imidicloprid	mortality	film method
1011	semi-field	clothianidin	mortality	contact/oral/dust
1011	semi-field	clothianidin	behavior	contact/oral/dust
868	field	imidicloprid	behavior/homing	oral/sugar water
868	field	imidicloprid	behavior/foraging rate	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging/trip duration	oral/sugar water
1934	field	imidicloprid	ny parameters/summer dev/winter sur	oral/sugar water
1760	field	imidicloprid	behavior/activity	oral/food
1760	field	imidicloprid	mortality	oral/food
1760	field	imidicloprid	colony parameter/weight gain	oral/food
1760	field	imidicloprid	behavior/pollen carrying	oral/food
1760	field	imidicloprid	brood development	oral/food
1923	semi-field	imidicloprid	behavior/foraging	contact and oral
1923	semi-field	imidicloprid	mortality	contact and oral
7242	lab	thiamethoxam	mortality	oral/sugar water
2183	field	imidicloprid	colony parameter/colony weight	field exposure
2183	field	imidicloprid	colony parameter/colony growth	field exposure
2183	field	imidicloprid	colony parameter/brood nest size	field exposure
2183	field	imidicloprid	colony parameter/comb size	field exposure
2183	field	imidicloprid	olony parameter/number returning be	field exposure
2183	field	imidicloprid	colony parameter/nollen carrying	field exposure
697	lah	imidicloprid	mortality	film method
7391	lab	imidicloprid	mortality	oral/sugar water
1133	lab	imidicloprid	mortality	oral/sugar water
1133	lab	imidicloprid	immunity/Total baemolymph count	oral/sugar water
7300	lab	imidicloprid	mortality	oral/sugar water
7390	lab	imidicloprid	Jogy/Development of hypopharyngeal	oral/sugar water
603	lab	imidicloprid	hrain mornhology	oral/sugar water
884	semi-field	clothianidin	mortality	contact
1023	Jah	imidicloprid	morphology/acini diameter	oral/sugar water
1802	lab	mix imidicloprid	morphology/acini diameter	oral/sugar water
1802	lab	mix imidicloprid	mortality	oral/sugar water
21Q	field	imidicloprid	colony parameters (collapse	l supplemental for overwir
1700	lah	imidicloprid	mortality	contact corn tassels
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	clothianidin	mortality	contact corn tassels
667	field	clothianidin	mortality	contact Com tassets
002 200⊑	lah	imidicloarid		oral/sugar water
2033	idD Iab	imidicloprid	behavior/locomation	contact /topical
2000	lau Iab	imidicloprid		contact/topical
2000	IdU	imuciopria	bellavior/PEK	
2000	lab	imaciopria	hobevier/evoidence	
010	lap	imaiciopria	penavior/avoidance	contact/oral/dust

833	field	thiamethoxam	behavior/homing rate	oral/sugar water
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/feeding	oral/sugar water
1954	lab	imidicloprid	sublethal/food intake	oral/sugar water
1954	lab	imidicloprid	behavior/PER	oral/sugar water
1709	lab	imidicloprid	mortality	contact corn tassels
622	lab	imidicloprid	behavior/reflex	oral/sugar water
622	lab	mix - imidicloprid	behavior/reflex	oral/sugar water
533	field	thiamethoxam	behavior/foraging	field foraging
534	lab	imidicloprid	behavior/coordination	oral
533	lab	thiamethoxam	behavior/foraging	oral
535	lab	imidicloprid	behavior/reflex	assumed oral
533	field	thiamethoxam	behavior/foraging	field foraging
143	cage	imidicloprid	avoidance/food intake	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
635	lab	imidicloprid	mortality	oral/sugar water
635	lab	mix - imidicloprid	mortality	oral/sugar water
635	lab	imidicloprid	hebavior/reflex	oral/sugar water
635	lab	mix - imidicloprid	hehavio/reflex	oral/sugar water
1922	field	imidicloprid	behavior/foragaing	oral/sugar water
1370	field	thiamethoxam	mortality	contact/foraging
1971	lah	imidicloprid	subletbal/activities	oral/sugar water
1021	lab	imidicloprid	sublethal/activities	oral/sugar water
2157	field	imidicloprid	hebyjor/orientation/foraging	oral/sugar water
2157	field	imidicloprid	behavior/orientation/foraging	oral/sugar water
2137	lab	clothianidin	immunity/deformed wing virus	contact/tonical
	lab	inidialoprid	immunity/deformed wing virus	
2207	Iab	imucioprid	/Densite metric analysis for Al and my	
2207	lab	imidicioprid	7 Densitometric analysis for AL and mu	
1107	lab	imidicioprid	genetic/change	oral/sugar water
1943	lab	imidicioprid	imidicioprid binding site	nead membranes
2160	lab	imidicioprid	mortality	oral/sugar water
2160	lab	imidicloprid	mortality	oral/sugar water
865	field	clothianidin	mortality	contact/dust
1845	lab	imidicloprid	behavior/PER	oral/sugar water
7352	field	thiamethoxam	behavior/foraging	oral/sugar water
7352	field	thiamethoxam	behavior/returning bees	oral/sugar water
7352	field	thiamethoxam	Behavior/returning bees	oral/sugar water
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
521	lab	imidicloprid	behavior/feeding	oral/syrup
7467	field	imidicloprid	behavior/foraging	contact/brassica
1306	lab	thiamethoxam	mortality	spray
1306	lab	thiamethoxam	mortality	contaminated diet
1306	lab	thiamethoxam	mortality	ontact/contaminated surface
1306	lab	thiamethoxam	mortality	contact/leaves

1370	field	thiamethoxam	mortality	contact/foraging
690	field	clothianidin	colony parameters/collapse	maize flower foraging
7467	field	imidicloprid	behavior/foraging	contact/brassica
7467	field	imidicloprid	behavior/foraging	contact/brassica
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
504	lab	imidicloprid	mortality	oral/sugar water
504	lab	imidicloprid	molecular response/gene expression	oral/sugar water
612	lab	imidicloprid	ology/Development of hypopharyngea	oral/pollen/sugar water
612	lab	imidicloprid	electrophysiology	oral/pollen/sugar water
505	lab	clothianidin	behavior/homing	oral/sugar water
397	lab	imidicloprid	binding to acetylcholine receptor	
788	lab	thiamethoxam	sublethal/biomarkers	contact
7260	lab	imidicloprid	mortality	contact/film
7260	lab	clothianidin	mortality	contact/film
1259	greenhouse	thiamethoxam	mortality	contact/oral/dust
654	lah	imidicloprid	acetylcholinesterase activity/brain	not stated
753	lab	imidicloprid	eclosion rate	into laraval combs
783	lab	imidicloprid	genetic change/larval gene expression	oral formula
7532	field	imidicloprid	behavior/foraging	oral/sugar water
1839	lah	imidicloprid	hehavior/symptoms	oral/sugar water
680	field	thiamethoxam	behavior/flower visits	field foraging
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
557	lah	clothianidin	immunity/immune response	contact/tonical
557	lab	clothianidin	immunity/immune response	contact/topical
0	lab	clothianidin	behavior/arching and wing block	oral guttation fluid
0	lab	thiamethoxam	behavior/arching and wing block	oral guttation fluid
0	lab	clothianidin	behavior/arching and wing block	oral guttation fluid
753	lab	imidicloprid	canned brood rate	into laraval combs
753	lab	imidicloprid	nunation rate	into laraval combs
873	lab	imidicloprid	hehavior/foraging and waggle dance	oral
1836	lab	imidicloprid	hebyior/refley	oral/sugar water
1836	somi-field	imidicloprid	behavior/learning	oral/sugar water
1020	lah	imidicloprid	behavior/PERefley	oral
1212	lab	imidicloprid	mortality	contact/filter paper
2162	Tuppol	imidicloprid	colony parameters (food intake	oral/sugar water
165	lab	imidicloprid	mortality	
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	
105		imidicloprid	mortality	all routes
105		imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
102	USI	imiaiciopria		all routes
102	USI	imiaiciopria		all routes
105	del	imiaiciopria	mortality	
165	lab	imidicioprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes

1265	lab	imidicloprid	mortality	
1265	lab	imidicloprid	mortality	
1265	lab	imidicloprid	mortality	
1265	lab	imidicloprid	mortality	
1265	lab	imidicloprid	mortality	
1265	lab	imidicloprid	mortality	
1265	lab	imidicloprid	mortality	
689	field	clothianidin	colony parameters	
1076	field	imidicloprid	colony parameter/collapse	
654	lab	imidicloprid	acetylcholinesterase activity/brain	
1419	lab	imidicloprid	electrophysiology	
1312	field	imidicloprid	mortality	
1312	field	imidicloprid	colony parameter	
1312	field	imidicloprid	mortality	
1312	field	imidicloprid	colony parameter	
1312	field	imidicloprid	mortality	
1954	lab	imidicloprid	mortality	
1954	lab	imidicloprid	mortality	
1954	lab	imidicloprid	mortality	
1954	lab	imidicloprid	mortality	
1954	lab	imidicloprid	, sublethal/food intake	
865	field	imidicloprid	mortality	
1687	Tunnel	thiamethoxam	behavior/foraging	
2162	Tunnel	imidicloprid	colony parameters/feeding duration	
1532	field	clothianidin	colony parameter/weight	C
1532	field	clothianidin	honey production	C
1532	field	clothianidin	mortality	C
1532	field	clothianidin	offspring production	C
1532	field	clothianidin	Over-wintering	C
1005	lab	imidicloprid	development/cell death	
2159	lab	imidicloprid	behavior/PER	
1803	field	imidicloprid	behavior/number foraging	
1236	lab	thiamethoxam	behavior/arching and wing block	
1954	lab	imidicloprid	behavior/PER	
1400	lab	imidicloprid	behavior/foraging	
1400	lab	imidicloprid	mortality	
1888	lab	imidicloprid	, effects of long term exposure	
1074	cage	imidicloprid	mortality	
1074	cage	imidicloprid	chronic food consu.	
1075	lab	imidicloprid	behavior/navigation	
1075	lab	imidicloprid	behavior/PEReflex	
1708	cage	imidicloprid	mortality	
1708	cage	imidicloprid	food intake	
1708	cage	imidicloprid	behavior/foraging	
1708	cage	imidicloprid	behavior/learning	
1690	field	thiamethoxam	Behavior/returning bees	со
2060	lab	imidicloprid	behavior/gustatory threshold	
750	lab	clothianidin	mortality	
750	semi-field	clothianidin	mortality	
750	semi-field	clothianidin	colony parameter/strength	
			, , ,	

all routes field exposure unknown origin not stated direct to antenae oral/sugar water contact/dust field exposure oral/sugar water ontact/foraging canola ontact/foraging canola ontact/foraging canola ontact/foraging canola ontact/foraging canola oral/larval food oral/diet ora/sugar water oral/guttation fluid oral/sugar water oral/sugar water oral/sugar water oral/sugar water oral/pollen oral/pollen oral/pollen oral/pollen oral/sugar water oral/sugar water oral/sugar water oral/sugar water ontact/foraging mustard contact/topical contact/leaves contact contact

750	semi-field	clothianidin	colony parameter/thermoregulation	contact
750	semi-field	clothianidin	colony parameter/behavior	contact
750	semi-field	clothianidin	colony parameter/flight	contact
750	lab	clothianidin	mortality	contact/leaves
818	field	imidicloprid	colony parameters/collapse	supplemental for overwir
2162	Tunnel	imidicloprid	ony parameters/visits to feeding static	oral/sugar water
1153	lab	imidicloprid	mortality/neurotoxicy	oral/food
820	lab	imidicloprid	behavior/distance travelled	oral/sugar water
820	lab	imidicloprid	behavior/interaction	oral/sugar water
820	lab	imidicloprid	behavior/time in food zone	oral/sugar water
1358	field	imidicloprid	behavior/foraging	oral/sugar water
2159	cage	imidicloprid	behavior/flight	oral/sugar water
2159	cage	imidicloprid	behavior/learning	oral/sugar water
7303	semi-field	clothianidin	mortality	talc/contact
7303	semi-field	clothianidin	colony parameter/strength	talc/contact
863	field	imidicloprid	colony parameter	oral supplements
935	lab	imidicloprid	mortality	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1801	semi-field	imidicloprid	, behavior/foraging	oral/sugar water
0	lab	imidicloprid	behavior/arching and wing block	oral.guttation fluid
1954	lab	imidicloprid	behavior/PER	oral/sugar water
758	lab	imidicloprid	mortality	oral/food
1118	lab	imidicloprid	ethyl oleate production	oral/sugar water
7391	lab	imidicloprid	sub-lethal/disease status	oral/sugar water
1085	field	thiamethoxam	mortality	dust/corn
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
505	lab	imidicloprid	behavior/homing	oral/sugar water
1954	lab	, metabolite of im.	behavior/PER	oral/sugar water
690	field	imidicloprid	colony parameters/collapse	maize flower foraging
2159	lab	imidicloprid	mortality	oral/diet
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
529	lab	imidicloprid	morphology/apoptosis nerve cells	oral
758	lab	imidicloprid	mortality	oral/food
920	field	imidicloprid	colony parameter/survival	contact/foraging
1277	field	imidicloprid	colony parameter/collapse	contact foraging maize
486	desk	clothianidin	mortality	contact/dust/corn
486	desk	anidin and thiameth	mortality	contact/dust/corn
1180	cage	clothianidin	mortality	field exp./potato
-	0 -	-	,	
7346	lab	thiamethoxam	Enzymes/AChE activity	contact/acetone sol.
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1186	greenhouse	clothianidin	mortality	contact
895	field	combination of all	colony parameters	contact/foraging
1264	field	imidicloprid	colony parameters	contact/foraging

0.02%	positive	number of visits to flowers reduced
0.02%	positive	69% mortality at 72 hours
1.25 mg/seed dust	negative	"Chemical analysis showed high quantities of neonicotinoid insecticide
g/seed dust 30 min. e:	positive	50-97% mortality
(1.8) (ng/bee)	positive	mortality significantly higher
.02828kg a.i./ha	positive	97% mortality with 2 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
.0325ng/bee	negative	abstract says positive for other markers
.0325ng/bee	positive	AchE activity much higher
.0325ng/bee	negative	no significant difference in mortality
.11kg a.i./ha	positive	33% mortality at 2 hours
.168kg a.i./ha	positive	increased from 14% to 19% in 2 hours
0 µg/kg	control	1 of 4 colonies collapsed at 23 weeks
0.0005-0.05 %	positive	100% mortality at .03%
0.0005-0.05 %	positive	70% mortality at 300 minutes at lowest dose
0.0005-0.05 %	positive	90% mortality at .05%
0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
0.002-0.02 mg/kg	negative	
0.004-0.008 % a.i.	positive	Activity less with exposure
0.004-0.008 % a.i.	positive	Activity less with exposure
0.005 g a.i./m2	negative	not significant
0.005-0.03 μg/bee	borderline	imidicloprid toxicity not affected by diet
0.00583 ml/cm2	positive	100% mortality after 2.61 hours
0.00583 ml/cm2	positive	100% mortality after 1 hour
0.00583 ml/cm2	positive	100% mortality after 1.51 hours
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.025-0.1 lb a.i./acre	borderline	up to 19% mortality which is more than overwintering
0.04 ng/larva	positive	significant olfactory impairment dose dependent
0.0428 ng a.i./L diet	positive	sub-lethal doses cause organ damage while metabolizing the pesticide. Damag
).0428-0.428 ng a.i./µ	positive	sublethal doses cause damage to brain and midgut
0.08-125 ug/L	negative	no difference
0.08-125 ug/L	negative	no difference
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels

1 (4wk)/20 (9wk) µg/l	positive	3 of 4 colonies collapsed at 19-23 weeks
0.1 mg/seed	positive	
0.1 mg/seed	positive	87% mortality with brief dusting
0.100 mg a.i./ml	positive	100% mortality
0.1-1 ng/bee	negative	
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed
0.1-1 ng/bee	negative	"Thiamethoxam by contact induced either a significant decrease of olfac
0.1-1 ng/bee	negative	"Responsiveness to antennal sucrose stimulation was significantly decre
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeyb
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed
0.1-1 ng/bee	positive	"Thiamethoxam by contact induced either a significant decrease of olfac
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
0.1-1 ng/bee	negative	THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY REP
0.1-1 ng/bee	negative	
0.1-1 ng/bee	positive	significant impairment of PER function
0.1-10 ng/bee	positive	significant impairment of PER function
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.112 kg(a.i.)/ ha	positive	60% reduction in foraging
0.112 kg(a.i.)/ ha	negative	no significant difference
0.12-0.24 ng/bee	positive	AchE activity much higher
0.12-12 ng/bee	positive	A significant increase of CO staining
0.15-6ng/bee	positive	number of feeder visits decreased by up to 98%
0.15-6ng/bee	positive	at 3ng, reduced mobility observed
0.15-6ng/bee	positive	trip duration increased by 50% to 130%
0.15-6ng/bee	positive	time spent at feeder increased up to 47%
0.15-6ng/bee	positive	flight time to feeder increased up to 241%
0.15-6ng/bee	positive	flight time to hive increased up to 210%
0.15-6ng/bee	positive	intervals between feedings increased by 33% up to 993% respectively
0.15-6ng/bee	positive	80% fewer bees returned. Demonstrated distended bellies, legs shaking, death
0.1ug/bee	positive	learning and memory significantly impaired
0.2 g/litre	positive	number of returning bees greatly affected
0.20 mg a.i./ml	positive	100% mortality
0.24 mg/seed	negative	hives were placed in field when flowers bloomed not when planted so seed dus
0.24 mg/seed	negative	hive placed after bloom
0.24 mg/seed	negative	hive placed after bloom
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24-0.30 ng/bee	positive	hyperactivity - tremors - higher mortality
0.25 ml/L	positive	mortality 4 times higher

0.3-0.6 ng/bee	positive	PER significantly affected
0.3-0.6 ng/bee	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.50 ml/L	positive	mortality 4 times higher
0.5-2 g a.i./ha	positive	mortality increased with dosage
0.5-2 g a.i./ha	positive	risk greatest at edge of field
0.5-2 ng/bee	positive	feeder visits reduced significantly
0.5-2 ng/bee	positive	duration of trips significantly affected
0.5-2 ng/bee	positive	time spent at feeder increased by up to 100%
0.5-2 ng/bee	positive	duration of trips significantly affected
0.5-5 ppb	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	positive	significant increase in pollen carrying
0.5-5.0 μg/lin syrup	positive	significant difference in capped brood
0.6-14 g a.i./ha	positive	significant foragaging impairment at higher dosages
0.6-14 g a.i./ha	negative	no effect
0.727 ng/bee/d	positive	mortality significantly increased with time
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	borderline	some changes but not in all endpoints
0.75 ml/L	positive	mortality 4 times higher
0.7-70 μg/kg	positive	mortality increase especially with nosema
0.7-70 μg/l	positive	Highest mortality in bees infected with Nosema
0.7-70 μg/l	negative	not significant
0.7-70 μg/l	positive	highest mortality at 11 days
0.7-70 μg/l	positive	Imidacloprid had a greater effect as the acorns were much more atrophied
0.809-8.09 ng/bee	positive	apoptosis of brain cells confirmed
1 g a.i./ha (x≤160 µm)	positive	mortality significantly higher
1 ppb	positive	acini declined by dose
1.00.1-10.0 μg/L	positive	significant mortality in all groups
1.00.1-10.0 μg/L	positive	mortality at all levels
1 (4wk)/ 40 (9wk) μg/	positive	4 of 4 colonies collapsed starting at 16 weeks
1.25 mg a.i./seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
1.25 mg/seed	positive	100% mortality with brief dusting
1.25-20 ng/bee	positive	significant impairment of PER function
1.25-5 ng/bee	positive	significant increase in immobility and loss of coordination
1.25ng/bee	positive	significant impairment of PER function
1.25ng/bee	positive	significant staining observed
1.28 ng/bee	negative	not significant

1.34 ng/bee	positive	significant reduction in homing up to 31% failed to return to hive when hive reg
1.5-100 mg/L	positive	wing block within 1 hour
1.5-3 ng/bee	positive	intervals between flights significantly increased
1.5-3 ng/bee	positive	time in hive increased
1.5-48 ug/kg	negative	not significant
1.5-96 ug/kg	positive	significant impairment of PER function
1.6/2,5 g a.i. /kg seed	negative	not significant
1.8ng/bee	negative	not significant
1.8ng/bee	negative	not significant
1/10 LD50	positive	significant reduction of motor coordination
1/100 of LD50	positive	loss of coordination
1/5 of LD50	positive	could not discriminate between food and non food sources
1/5 of LD50	positive	impaired sucrose metabolism
1/50 LD50	positive	return rate significantly lowered
10 ppm	positive	85% fewer feeding visits
10.1-10ng/bee	positive	significant impairment of PER function
5 (4wk)/ 400 (9wk) µg	positive	All colonies failed between 14 and 18 weeks
1000 nmol/l	positive	mortality significantly higher
1000 nmol/l	positive	mortality significantly higher
1000 nmol/l	positive	significant impairment of all functions
1000 nmol/l	positive	significant impairment of all functions
100-1000 ppb	positive	100% mortality after 24 hours at higher dosage
100-300 g a.i./ha	positive	Mortality increased as exposure and dosage increased
100-500 ppb	positive	significantly less active
100-500 ppb	positive	effects within 1 hour vanished after 30 hours
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
10-30ng/bee	positive	virus replicated faster/dose dependent
10-30ng/bee	positive	virus replicated faster/dose dependent
10-8-10-4 M	positive	increased cytochrome oxidase (CO) labelling within 30 min in all the structures
10mg.l	positive	The AccGtpx-1 gene was induced after treatments with imidacloprid
110 µM	positive	potent inhibitors (IC50) 1-9 $\mu\text{M}$ ) of [3H]TCP binding to Apis head membranes,
1-1000ng/bee	positive	100% mortality starting at 200ng/bee
1-1000ng/bee	positive	toxic to all worker bees
118-674 ng/bee	positive	100% mortality in high humidity starting at 20 minutes to 8 hours
12 ng/bee	positive	significant decrease in performance
1-2 ng/bee	positive	significant reduction in number of trips
1-2 ng/bee	positive	time to return significantly higher
1-2 ng/bee	positive	number returning declined signficiantly
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
125 μg/L	negative	not significant
140 ml/ha	negative	not significant
150 g/100L H2O	positive	71% mortality after 1 hour, 100% mortality after 9 hours
150 g/100L H2O	positive	99% mortality at 24 hours
150 g/100L H2O	positive	56% mortality 1 hour after contact
150 g/100L H2O	positive	100% mortality at 9 hours

15-200 g a.i./ha	positive	Mortality increased as exposure and dosage increased
156 mL per 50,000	negative	study reported that there were other plants in the area that are favored over th
168 ml/ha	negative	not significant
196 ml/ha	negative	not significant
1ng/bee	negative	not significant
1ng/bee	negative	testing use of metabolite
1ng/bee	negative	testing use of metabolite
1ng/bee	negative	testing use of metabolite
2 μg/L	positive	70% increase in mortality in those with parasites
2 μg/L	positive	affected immune related genes
2.1 (sugar water)	positive	hypopharyngeal glands significantly smaller
2.1 (sugar water)	negative	not significant
2.5 ng/bee	positive	longer flight paths
2.53 μM (Ki)	positive	Strong binding
2.56-51.16	positive	but there were changes in gene expression
20 g a.i./ha	positive	100% mortality at 24 hours
20 g a.i./ha	positive	100% mortality at 2 hours
200 g/ha	positive	100% mortality after 330 minutes
200 nM	positive	inhibited ACHe response
2000 ng/larava	positive	eclosion rates significantly affected from 2000 up
200ppm	negative	significantly more dead than controls
20-100 ppb	positive	mortality increased with dosage
20-50 μg/kg	positive	hyperactivity - tremors - higher mortality
g insecticide/20L of wa	positive	65% mortality with brief dusting
20ml/hl - 12 ± 0.5 hl/h	positive	sharp decline in foraging followed by partial improvement
21ng/bee	positive	supressed immune response
21ng/bee	positive	agonist of acetylcholine receptor disrupts immune response
23.3 mg/L	positive	wing block within 2 to 9 minutes
23.3 mg/L	positive	more toxic than clothianidin
23.3 mg/L	positive	dose dependent
24 ng/larava	positive	signficantly different than control. Most removed by nurse bees
24 ng/larava	positive	pupation rates significantly affected
24 ppb	positive	no difference in foragaging but significant difference in dance
24 μg/kg	positive	PER significantly affected
24 µg/kg	positive	foraging behavior significantly impaired
24-241 ppb	positive	Fewer PER responses that were further reduced by dose increase
25 g a.i./ha	positive	50% mortality in 24 hours
25 μg/kg	positive	decrease in consumption of food
25.0 g a.i./ha	positive	100% mortality over two seasons
25.0 g a.i./ha	positive	87% mortality with shorter administration
25.0 g a.i./ha	positive	100% mortality over two seasons
25.0 g a.i./ha	positive	67% mortality with shorter administration
25.0 g a.i./ha	positive	57% mortality with shorter administration
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	negative	low mortality if bees exposed 3 days later
25.0 g a.i./ha	positive	100%mortality at 0 hours aged residue

25.0 g a.i./ha	positive	87% mortality over two seasons for 1 hour residue
25.0 g a.i./ha	positive	74% mortality for 4 hour residue
25.0 g a.i./ha	positive	64% mortality for 8 hour residue
25.0 g a.i./ha	positive	41% mortality for 24 hour aged residues
25.0 g a.i./ha	positive	22% mortality for 48 hour aged residues
25.0 g a.i./ha	positive	15% mortality for 72 hour aged residues
25.0 g a.i./ha	positive	7.5% mortality for 120 hour aged residues
DL, 5000x diluted -at 2	negative	"The results indicated that clothianidin spraying of the rice field increased the n
27 (14-39) ng/g	positive	colonies contaminated by unknown source of neonics.
295 nM	positive	inhibited ACHe response
3.4 μM	borderline	partial agonist of nAChRs on AL neurones,
3.55 ng a.i./L	negative	neurotocity determined
3.55 ng a.i./L	negative	"Our observations point towards decays of overall colony vitality
3.55 ng a.i./L	negative	
3.55 ng a.i./L	negative	
3.55 ng a.i./L	negative	study abstract says positive for all but one endpoint
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	negative	not significant
30-240 ug/kg	positive	significantly lower food intake
30-3661 ng/bee	positive	100% mortality in high humidity
30ml/hl - 12 ± 0.5 hl/h	positive	foraging behavior significantly impaired
3-100 μg/kg	positive	duration of feeding declined
32 g a.i./ha	negative	not significant
32 g a.i./ha	negative	not significant
32 g a.i./ha	negative	
32 g a.i./ha	negative	
32 g a.i./ha	negative	
400 ppm	positive	high rate of apoptosis
4-40ppb	positive	significant impairment of PER function
45.9 g a.i./ha	negative	not significant
47 mg/L	positive	wing block within 2 to 6 minutes
48 ug/kg	positive	significant impairment of PER function
48 μg/kg(ppb)	negative	But bees took significantly longer to consume sugar water
48 μg/kg(ppb)	negative	Mortality did not increase
4-8 μg/L	borderline	some changes but not in all endpoints
48ng/g	negative	20% mortality compared to 15%
48ng/g	positive	consumption of treated pollen significantly less
48ppb	positive	navigation significantly impaired
48ppb	positive	not significant
48ug/kg	negative	no significant difference in mortality
48ug/kg	positive	lower food intake in treated group
48ug/kg	positive	significantly less foraging behavior in treated group
48ug/kg	borderline	learning impaired but not significant
4g/kg seed	negative	difference not considered significant
5 ng/bee	positive	significant loss of sensitivity
5.12 ug/m2	positive	mortality increased over time
5.12 ug/m2	positive	mortality increased over time
5.12 ug/m2	positive	colony strength affected

5.12 ug/m2	negative	no change in thermoregulation
5.12 ug/m2	negative	no significant change
5.12 ug/m2	positive	flight activity higher in treated group
5.12 ug/m2 x 3 hours	positive	mortality increased over time
3 (4wk)/ 200 (9wk) µg,	positive	All colonies failed
50 µg/kg	positive	number of visits declined to 0 during phase 2
500 ng/kg	positive	Decrease in HPG acinal diameter with exposure duration.
50-500 ppb	borderline	difference not considered significant
50-500 ppb	positive	lower dose no effect/ higher dose strong effect
50-500 ppb	positive	less interaction dose dependent
50-6000 μg/l	positive	At concentrations >1200 $\mu$ g/l, all bees showed abnormal foraging behaviour.
50ppb	positive	flight impaired
50ppb	positive	olafactory discrimination fell by 50% but recovered
51.2 ug/m2	borderline	comparing two pesticides
51.2 ug/m2	positive	high mortality and colony strength decline
5-20 ppb	positive	difficulty when exposed to other toxins as compared to controls
50 ng/µl 1mM verapaı	borderline	significantly higher mortality
(5x10 -9-5x10 -7) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 -9-5x10 -7) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 -9-5x10 -7) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 -9-5x10 -7) ng a	positive	100% mortality at 150 hours
5x10-6-1.5x10-3 m/ml	positive	especially high mortality in bees with virus
5x10-6-1.5x10-3 m/ml	positive	highest mortality in younger bees
5x10-6-1.5x10-3 m/ml	positive	90% mortality
5x10-6-1.5x10-3 m/ml	positive	younger bees regurgitated but were damaged
5x10-6-1.5x10-3 m/ml	negative	In Malpighian tubules treated with insecticide a smaller basophilic was observe
6 μg/kg	positive	significant difference in activity that was dose and time dependent
6.25-100 mg/L	positive	wing block within 2 to 9 minutes
60-240 ug/kg	positive	significant impairment of PER function
68ppb	negative	Formula was adjusted by Abbott and then retested providing stated results
7 μg/kg	negative	not significant
7 μg/kg	positive	disease progressed more rapidly in treated group
7.35 g a.i./ha20%	positive	mortality significantly higher
7.35 g a.i./ha50%	positive	foraging behavior significantly impaired
7.5-11.25 ng/bee	positive	unable to reach the hive
7.5-240 ug/kg	negative	not significant
/150 mL per 50,000 se	negative	study reported that there were other plants in the area that are favored over th
8-40ppb	positive	mortality significantly higher
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
9.9ng/bee	positive	apoptosis of nerve cells confirmed and increased with dosage
96ppb	positive	Formula was adjusted by Abbot
dust	positive	higher mortality, higher queen mortality and lower hive weight
dust	negative	"However, additional studies are needed to better understand possible synergie
field exposure	positive	High mortality reported in 2012
field exposure	positive	High mortality reported in 2012
general exp.	positive	mortality increased over time

not stated	positive	acetylcholinesterase and carboxylesterase significantly decreased
unknown	positive	averaged 123 dead bees per colony at day 1
varied	negative	"However, the risk exposure of bee colonies on adverse impact of pestic
varied	negative	not significant

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820	lab	imidicloprid	behavior/distance travelled	oral/sugar water
859	lab	imidicloprid	mortality	contact/topical
935	lab	imidicloprid	mortality	oral/sugar water
1419	lab	imidicloprid	electrophysiology	direct to antenae
1708	cage	imidicloprid	behavior/learning	oral/sugar water
1888	lab	imidicloprid	effects of long term exposure	oral/sugar water
2183	field	imidicloprid	colony parameter/pollen carrying	field exposure
7303	semi-field	clothianidin	mortality	talc/contact
7556	semi-field	imidicloprid	mortality	contact/leaves alfalfa
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
143	cage	imidicloprid	behavior/foraging	field exposure/apple
165	lab	imidicloprid	mortality	all routes
521	lab	imidicloprid	behavior/feeding	oral/svrup
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
560	field	thiamethoxam	colony parameter/hive weight	flower foraging
505 601	neid	clothianidin	mortality	oral/sugar water
601	Cage	clothianidin	mortality/hyporactivity	oral/sugar water
612	Lage	imidicloprid		oral/pollon/sugar water
612	lab	imidicloprid	helpsvier (avgidence	oral/polien/sugar water
010	lab	imidicioprid	behavior/avoidance	
622	lab	Imidicioprid	behavior/reflex	oral/sugar water
622	ab	mix - imidicióprid	behavior/reflex	oral/sugar water
689	field	ciothianidin	colony parameters	tield exposure
690	field	clothianidin	colony parameters/collapse	maize flower foraging
690	field	imidicloprid	colony parameters/collapse	maize flower foraging
744	lab	imidicloprid	feeding rate	oral/sugar water
744	lab	imidicloprid	survival/longevity	oral/sugar water
750	semi-field	clothianidin	colony parameter/thermoregulation	contact
750	semi-field	clothianidin	colony parameter/behavior	contact
758	lab	imidicloprid	mortality	oral/food
783	lab	imidicloprid	genetic change/larval gene expression	oral formula
895	field	combination of all	colony parameters	contact/foraging
978	field	clothianidin	mortality	contact/foraging
984	lab	imidicloprid	behavior/reflex	oral/sugar water
1074	cage	imidicloprid	mortality	oral/pollen
1118	lab	imidicloprid	ethyl oleate production	oral/sugar water
1133	lab	imidicloprid	immunity/Total haemolymph count	oral/sugar water
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1264	field	imidicloprid	colony parameters	contact/foraging
1277	field	imidicloprid	colony parameter/collapse	contact foraging maize
1312	field	imidicloprid	mortality	oral/sugar water
1312	field	imidicloprid	colony parameter	oral/sugar water
1312	field	imidicloprid	mortality	oral/sugar water

1312	field	imidicloprid	colony parameter	oral/sugar water
1312	field	imidicloprid	mortality	oral/sugar water
1314	lab	thiamethoxam	mortality	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	behavior	contact/topical
1314	lab	thiamethoxam	chronic/probiscus extension	contact/topical
1314	lab	thiamethoxam	locomotor	contact/topical
1314	lab	thiamethoxam	sugar respons3	contact/topical
1400	lab	imidicloprid	behavior/foraging	oral/sugar water
1400	lab	imidicloprid	mortality	oral/sugar water
1408	lab	thiamethoxam	, behavior/locomotion	oral/sugar water
1408	lab	thiamethoxam	behavior/PEReflex	contact/topical
1408	lab	thiamethoxam	behavior/locomotion/learning	oral/topical
1408	lab	thiamethoxam	behavior/reflex	topical contact
1532	field	clothianidin	colony parameter/weight	contact/foraging canola
1532	field	clothianidin	honey production	contact/foraging canola
1532	field	clothianidin	mortality	contact/foraging canola
1532	field	clothianidin	offspring production	contact/foraging canola
1532	field	clothianidin	Over-wintering	contact/foraging canola
1600	field	thiamethovam	Behavior/returning bees	contact/foraging mustard
1708	Care	imidicloprid	mortality	oral/sugar water
1700	lab	imidicloprid	mortality	contact corn tassels
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	clothianidin	mortality	contact corn tassels
1709	idD field	ciotinidinium	mortality	contact corn tassets
1760	field	imidicioprid	benavior/activity	oral/food
1760	field	imidicioprid	mortality	oral/food
1/60	field	imidicioprid	colony parameter/weight gain	oral/tood
1803	tield	imidicioprid	benavior/number foraging	ora/sugar water
1923	semi-field	imidicloprid	mortality	contact and oral
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1934	field	imidicloprid	ny parameters/summer dev/winter sur	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1954	lab	imidicloprid	mortality	oral/sugar water
1954	lab	imidicloprid	sublethal/food intake	oral/sugar water
1954	lab	metabolite of im.	behavior/PER	oral/sugar water

2139	semi-field	imidicloprid	behavior/foraging	oral/food/honey
2139	semi-field	imidicloprid	honey production	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/weight gain	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/offspring	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	mortality	oral/food/honey
2183	field	imidicloprid	colony parameters/weight gain	field exposure
2183	field	imidicloprid	olony parameter/number returning be	field exposure
2183	field	imidicloprid	colony parameters/pollen carrying	field exposure
2183	field	imidicloprid	colony parameters/visits to flowers	field exposure
2183	field	imidicloprid	pollination/fruit set	field exposure
2183	field	imidicloprid	colony parameter/colony weight	field exposure
2183	field	, imidicloprid	colony parameter/colony growth	field exposure
2183	field	imidicloprid	colony parameter/brood nest size	field exposure
2183	field	imidicloprid	colony parameter/comb size	field exposure
2183	field	imidicloprid	plony parameter/number returning be	field exposure
7467	field	imidicloprid	behavior/foraging	contact/brassica
7467	field	imidicloprid	behavior/foraging	contact/brassica
7467	field	imidicloprid	behavior/foraging	contact/brassica
7533	tent	innalelopha	colony narameters/varied	field exposure
0	lah	clothianidin	behavior/arching and wing block	oral guttation fluid
0	lab	thiamethoxam	behavior/arching and wing block	oral guttation fluid
0	lab	imidicloprid	behavior/arching and wing block	oral guttation fluid
0	lab	clothianidin	hehavior/arching and wing block	oral guttation fluid
0	lab	thiamethoxam	behavior/arching and wing block	oral guttation fluid
1/13	Cage	imidicloprid	mortality	contact/alfalfa
1/2	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
145	cage	imidicloprid	mortality	contact/alialia
145	Cage	imidicloprid	mortanty avoidance/food intake	contact/analia
145	Cage	imidicloprid	behavior (foraging	field expective (dendelion
143	Cage	imidicioprid	benavior/foraging	neid exposure/dandellon
165	lab	imidicioprid	mortality	all routes
165	lab	imidicioprid	mortality	all routes
165	lab	imidicioprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
319	cage	imidicloprid	mortality	contact/alfalfa
326	cage	imidicloprid	mortality	contact/alfalfa
397	lab	imidicloprid	binding to acetylcholine receptor	
486	desk	clothianidin	mortality	contact/dust/corn
486	desk	anidin and thiamet	r mortality	contact/dust/corn
500	lab	thiamethoxam	organ damage	oral/syrup
504	lab	imidicloprid	mortality	oral/sugar water

504	lab	imidicloprid	molecular response/gene expression	oral/sugar water
505	lab	imidicloprid	behavior/homing	oral/sugar water
505	lab	clothianidin	behavior/homing	oral/sugar water
529	lab	imidicloprid	morphology/apoptosis nerve cells	oral
533	field	thiamethoxam	behavior/foraging	field foraging
533	field	thiamethoxam	behavior/foraging	field foraging
533	lab	thiamethoxam	behavior/foraging	oral
534	lab	imidicloprid	behavior/coordination	oral
535	lab	imidicloprid	behavior/reflex	assumed oral
545	lab	thiamethoxam	mortality	contact/leaves
545	lab	thiamethoxam	mortality	contact/spray
545	lab	thiamethoxam	mortality	oral/sugar water
557	lab	clothianidin	immunity/immune response	contact/topical
557	lab	clothianidin	immunity/immune response	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water
557	lab	imidicloprid	immunity/deformed wing virus	oral/sugar water
580	lab	imidicloprid	hebayior/learning	oral/honey
601	cage	imidicloprid	enzymes/aCHe activity	oral/sugar water
601	cage	imidicloprid	mortality/hyperactivity	oral/sugar water
601	cage	clothianidin	enzymes/aCHe activity	oral/sugar water
603	lah	imidicloprid	brain mornhology	oral/sugar water
612	lab	imidicloprid	alogy/Development of hypopharyngea	oral/nollen/sugar water
635	lab	imidicloprid	mortality	oral/sugar water
635	lab	mix - imidicloprid	mortality	oral/sugar water
635	lab	imidicloprid	hebayior/reflex	oral/sugar water
625	lab	miv imidicloprid	behavio/reflex	oral/sugar water
657	lab	imidicloprid	acotylcholinostoraso activity/brain	not stated
654	lab	imidicloprid	acetylcholinesterase activity/brain	not stated
662	iau fiald	alathianidin		not stated
662	field	ciotinianium	mortality	
662	field	this matheware	mortality	
662	field	thiamethoxam	mortanty	contact/dust
680	field	thiamethoxam	benavior/flower visits	field foraging
697	lab	imidicloprid	mortality	film method
697	lab	imidicloprid	mortality	film method
697	lab	imidicloprid	mortality	film method
750	lab	clothianidin	mortality	contact/leaves
750	lab	clothianidin	mortality	contact/leaves
750	semi-field	clothianidin	mortality	contact
750	semi-field	clothianidin	colony parameter/strength	contact
750	semi-field	clothianidin	colony parameter/flight	contact
753	lab	imidicloprid	capped brood rate	into laraval combs
753	lab	imidicloprid	pupation rate	into laraval combs

753	lab	imidicloprid	eclosion rate	into laraval combs
753	lab	imidicloprid	behavior/probosis extenion/PER	into laraval combs
758	lab	imidicloprid	mortality	oral/food
788	lab	thiamethoxam	sublethal/biomarkers	contact
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
820	lab	imidicloprid	behavior/interaction	oral/sugar water
820	lab	imidicloprid	behavior/time in food zone	oral/sugar water
823	lab	imidicloprid	behavior/foraging and waggle dance	oral
823	lab	imidicloprid	behavior/PEReflex	oral
833	field	thiamethoxam	behavior/homing rate	oral/sugar water
863	field	imidicloprid	colony parameter	oral supplements
865	field	clothianidin	mortality	contact/dust
865	field	imidicloprid	mortality	contact/dust
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/homing	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	clothianidin	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/homing rates	oral/sugar water
868	field	imidicloprid	behavior/homing	oral/sugar water
868	field	imidicloprid	behavior/foraging rate	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging/trip duration	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/feeding	oral/sugar water
884	semi-field	clothianidin	mortality	contact
915	field	imidicloprid	behavior/flower visits	contact/foraging
920	field	imidicloprid	colony parameter/survival	contact/foraging
978	field	clothianidin	mortality	contact/foraging
984	lab	imidicloprid	behavior/reflex/PER	oral/sugar water
1005	lab	imidicloprid	development/cell death	oral/larval food
1011	semi-field	clothianidin	mortality	contact/oral/dust
1011	semi-field	clothianidin	behavior	contact/oral/dust
1023	lab	imidicloprid	morphology/acini diameter	oral/sugar water
1074	cage	imidicloprid	chronic food consu.	oral/pollen
1075	lab	imidicloprid	behavior/navigation	oral/pollen
1075	lab	imidicloprid	behavior/PEReflex	oral/pollen
1076	field	imidicloprid	colony parameter/collapse	unknown origin
1085	field	thiamethoxam	mortality	dust/corn
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
1107	lab	imidicloprid	genetic/change	oral/sugar water
1133	lab	imidicloprid	mortality	oral/sugar water
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1146	lab	thiamethoxam	mortality	oral/honey insecticide

1146	lab	thiamethoxam	mortality	oral/honey insecticide
1153	lab	imidicloprid	mortality/neurotoxicy	oral/food
1164	field	imidicloprid	behavior/activity	contact/foraging
1164	field	thiamethoxam	behavior/activity	contact/foraging
1171	field	clothianidin	mortality	contact/foraging
1180	cage	clothianidin	mortality	field exp./potato
1186	greenhouse	clothianidin	mortality	contact
1213	lab	imidicloprid	mortality	contact/filter paper
1236	lab	thiamethoxam	behavior/arching and wing block	oral/guttation fluid
1259	greenhouse	thiamethoxam	mortality	contact/oral/dust
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	, imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1306	lab	thiamethoxam	mortality	sprav
1306	lab	thiamethoxam	mortality	contaminated diet
1306	lab	thiamethoxam	mortality	untact/contaminated surface
1306	lab	thiamethoxam	mortality	contact/leaves
1314	lab	thiamethoxam	learning	contact/tonical
1358	field	imidicloprid	hehavior/foraging	oral/sugar water
1370	field	thiamethoxam	mortality	contact/foraging
1370	field	thiamethoxam	mortality	contact/foraging
1/72	lah	thiamethoxam	mortality	contact/citrus leaves
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1611	field	imidicloprid	mortality	contact/clifus leaves
1697	Tuppol	thismothoyam	hohavior/foraging	field expective
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
1600	field	thiamethoxam	Dehavior/roturning boos	contact/foraging mustard
17090	neiu	imidicloprid	food intake	oral/cugar water
1700	Cage	imidicloprid	hobovier/foraging	oral/sugar water
1708	Cage	imidicloprid	behavior/foraging	oral/sugar water
1760	field	imidicloprid	benavior/polien carrying	oral/food
1001	neiu comi fiold	imidicloprid	brood development	oral/cugar water
1801	Serni-neiu		Denavior/Toraging	oral/sugar water
1802	lab	mix imidicioprid	mortality	oral/sugar water
1802	lab	mix imidicioprid	mortality	oral/sugar water
1836		imidicioprid	benavior/reflex	oral/sugar water
1836	semi-field	imidicloprid	behavior/learning	oral/sugar water
1839	lab	imidicloprid	behavior/symptoms	oral/sugar water
1845	lab	imidicloprid	behavior/PER	oral/sugar water
1845	lab	imidicloprid	histochemestry	oral/sugar water
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
1922	field	imidicloprid	behavior/foragaing	oral/sugar water
1923	semi-field	imidicloprid	behavior/foraging	contact and oral
1943	lab	imidicloprid	imidicloprid binding site	head membranes
1949	lab	imidicloprid	behavior/PER	oral/sugar water

1949	lab	metabolite of im.	behavior/PER
1954	lab	imidicloprid	mortality
1954	lab	imidicloprid	mortality
1954	lab	imidicloprid	mortality
1954	lab	imidicloprid	sublethal/food intake
1954	lab	imidicloprid	behavior/PER
1954	lab	imidicloprid	behavior/PER
1954	lab	imidicloprid	behavior/PER
1970	lab	imidicloprid	mortality
1970	lab	imidicloprid	mortality
1970	lab	imidicloprid	mortality
2060	lab	imidicloprid	behavior/gustatory threshold
2060	lab	imidicloprid	behavior/locomotion
2060	lab	imidicloprid	behavior/PER
2060	lab	imidicloprid	histochemestry
2095	lab	imidicloprid	behavior/PER
2096	lab	, imidicloprid	mortality
2096	lab	, metabolite of im.	mortality
2096	lab	metabolite of im.	mortality
2096	lab	metabolite of im.	mortality
2096	lab	metabolite of im.	mortality
2096	lab	metabolite of im.	mortality
2096	lab	metabolite of im.	mortality
2112	lab	imidicloprid	behavior/PER
2157	field	imidicloprid	behavior/orientation/foraging
2157	field	imidicloprid	behavior/orientation/foraging
2159	lab	imidicloprid	mortality
2159	lab	imidicloprid	behavior/PER
2159	cage	imidicloprid	behavior/flight
2159	cage	imidicloprid	behavior/learning
2160	lab	imidicloprid	mortality
2160	lab	imidicloprid	mortality
2162	Tunnel	imidicloprid	ony parameters/visits to feeding static
2162	Tunnel	imidicloprid	colony parameters/food intake
2162	Tunnel	imidicloprid	colony parameters/feeding duration
2207	lab	imidicloprid	/Densitometric analysis for AL and mu
7242	lab	thiamethoxam	mortality
7260	lab	imidicloprid	mortality
7260	lab	clothianidin	mortality
7274	lab	thiamethoxam	Morphology/histochemistry/
7302	lab	thiamethoxam	mortality
7302	lab	thiamethoxam	mortality
7302	lab	thiamethoxam	mortality
7302	lab	thiamethoxam	mortality
7303	semi-field	clothianidin	colony parameter/strength
7346	lab	thiamethoxam	Enzymes/AChE activity
7352	field	thiamethoxam	behavior/foraging
7352	field	thiamethoxam	behavior/returning bees
7352	field	thiamethoxam	Behavior/returning bees
7390	lab	imidicloprid	mortality

oral/sugar water oral/solution oral/solution oral/solution contact/topical contact/topical contact/topical cranial injection oral/sugar water contact/topical oral/sugar water oral/sugar water oral/diet oral/diet oral/sugar water direct to brain oral/sugar water contact/film contact/film oral/sugar water oral/sugar water oral/sugar water oral/sugar water oral/sugar water talc/contact contact/acetone sol. oral/sugar water oral/sugar water oral/sugar water oral/sugar water

7390	lab	imidicloprid	logy/Development of hypopharyngeal	oral/sugar water
7391	lab	imidicloprid	mortality	oral/sugar water
7391	lab	imidicloprid	sub-lethal/disease status	oral/sugar water
7532	field	imidicloprid	behavior/foraging	oral/sugar water

50-500 ppb	borderline	difference not considered significant
0.005-0.03 μg/bee	borderline	imidicloprid toxicity not affected by diet
50 ng/µl 1mM verapar	borderline	significantly higher mortality
3.4 μM	borderline	partial agonist of nAChRs on AL neurones,
48ug/kg	borderline	learning impaired but not significant
4-8 μg/L	borderline	some changes but not in all endpoints
0.75 L/ha	borderline	some changes but not in all endpoints
51.2 ug/m2	borderline	comparing two pesticides
0.025-0.1 lb a.i./acre	borderline	up to 19% mortality which is more than overwintering
0 μg/kg	control	1 of 4 colonies collapsed at 23 weeks
0.112 kg(a.i.)/ ha	negative	no significant difference
25.0 g a.i./ha	negative	low mortality if bees exposed 3 days later
125 μg/L	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
.0325ng/bee	negative	abstract says positive for other markers
.0325ng/bee	negative	no significant difference in mortality
2.1 (sugar water)	negative	not significant
1.28 ng/bee	negative	not significant
1.8ng/bee	negative	not significant
1.8ng/bee	negative	not significant
DL, 5000x diluted -at 2	negative	"The results indicated that clothianidin spraying of the rice field increased the n
156 mL per 50,000	negative	study reported that there were other plants in the area that are favored over the
/150 mL per 50,000 s	negative	study reported that there were other plants in the area that are favored over the
0.08-125 ug/L	negative	no difference
0.08-125 ug/L	negative	no difference
5.12 ug/m2	negative	no change in thermoregulation
5.12 ug/m2	negative	no significant change
68ppb	negative	Formula was adjusted by Abbott and then retested providing stated results
200ppm	negative	significantly more dead than controls
varied	negative	"However, the risk exposure of bee colonies on adverse impact of pestic
1.25 mg/seed dust	negative	"Chemical analysis showed high quantities of neonicotinoid
0.3-0.6 ng/bee	negative	not significant
48ng/g	negative	20% mortality compared to 15%
/ µg/kg	negative	not significant
U. /- /U μg/I	negative	not significant
»x10-6-1.5x10-3 m/ml	negative	In Malpighian tubules treated with insecticide a smaller basophilic was observe
varied	negative	not significant
	negative	"However, additional studies are needed to better understand possible synergic
3.55 rig a.l./L	negative	neurotocity determined
5.55 IIg d.l./L	negative	Our observations point towards decays of overall colony vitality
כיכי און מיויר בי	negative	

3.55 ng a.i./L	negative	
3.55 ng a.i./L	negative	study abstract says positive for all but one endpoint
0.1-1 ng/bee	negative	
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeyb
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed
0.1-1 ng/bee	negative	"Thiamethoxam by contact induced either a significant decrease of olfac
0.1-1 ng/bee	negative	"Responsiveness to antennal sucrose stimulation was significantly decre
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed
48 μg/kg(ppb)	negative	But bees took significantly longer to consume sugar water
48 μg/kg(ppb)	negative	Mortality did not increase
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
0.1-1 ng/bee	negative	THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY REP
0.1-1 ng/bee	negative	
32 g a.i./ha	negative	not significant
32 g a.i./ha	negative	not significant
32 g a.i./ha	negative	-
32 g a.i./ha	negative	
32 g a.i./ha	negative	
4g/kg seed	negative	difference not considered significant
48ug/kg	negative	no significant difference in mortality
1.6/2,5 g a.i. /kg seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
45.9 g a.i./ha	negative	not significant
0.6-14 g a.i./ha	negative	no effect
0.24 mg/seed	negative	hives were placed in field when flowers bloomed not when planted so seed dus
0.24 mg/seed	negative	hive placed after bloom
0.24 mg/seed	negative	hive placed after bloom
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.24 mg/seed	negative	hive placed at bloom time
0.5-5 ppb	negative	not significant
1ng/bee	negative	not significant
1ng/bee	negative	testing use of metabolite
1ng/bee	negative	testing use of metabolite
1ng/bee	negative	testing use of metabolite
30.6 ng/bee	negative	not significant
1.5-48 ug/kg	negative	not significant
7.5-240 ug/kg	negative	not significant

0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
0.002-0.02 mg/kg	negative	
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
140 ml/ha	negative	not significant
168 ml/ha	negative	not significant
196 ml/ha	negative	not significant
0.005 g a.i./m2	negative	not significant
23.3 mg/L	positive	wing block within 2 to 9 minutes
23.3 mg/L	positive	more toxic than clothianidin
6.25-100 mg/L	positive	wing block within 2 to 9 minutes
23.3 mg/L	positive	dose dependent
1.5-100 mg/L	positive	wing block within 1 hour
.02828kg a.i./ha	positive	97% mortality with 2 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
.02828kg a.i./ha	positive	100% mortality with 8 hours aged residue
10 ppm	positive	85% fewer feeding visits
0.112 kg(a.i.)/ ha	positive	60% reduction in foraging
25.0 g a.i./ha	positive	100% mortality over two seasons
25.0 g a.i./ha	positive	87% mortality with shorter administration
25.0 g a.i./ha	positive	100% mortality over two seasons
25.0 g a.i./ha	positive	67% mortality with shorter administration
25.0 g a.i./ha	positive	57% mortality with shorter administration
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
.168kg a.i./ha	positive	increased from 14% to 19% in 2 hours
.11kg a.i./ha	positive	33% mortality at 2 hours
2.53 μM (Ki)	positive	Strong binding
field exposure	positive	High mortality reported in 2012
field exposure	positive	High mortality reported in 2012
0.0428 ng a.i./L diet	positive	sub-lethal doses cause organ damage while metabolizing the pesticide. Damag
2 μg/L	positive	70% increase in mortality in those with parasites

2 μg/L	positive	affected immune related genes
7.5-11.25 ng/bee	positive	unable to reach the hive
2.5 ng/bee	positive	longer flight paths
9.9ng/bee	positive	apoptosis of nerve cells confirmed and increased with dosage
1/10 LD50	positive	significant reduction of motor coordination
1/50 LD50	positive	return rate significantly lowered
1/5 of LD50	positive	could not discriminate between food and non food sources
1/100 of LD50	positive	loss of coordination
1/5 of LD50	positive	impaired sucrose metabolism
0.00583 ml/cm2	positive	100% mortality after 2.61 hours
0.00583 ml/cm2	positive	100% mortality after 1 hour
0.00583 ml/cm2	positive	100% mortality after 1.51 hours
21ng/bee	positive	supressed immune response
21ng/bee	positive	agonist of acetylcholine receptor disrupts immune response
10-30ng/bee	positive	virus replicated faster/dose dependent
10-30ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	, positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1-10 ppb	, positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.1-10 ppb	, positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1ug/bee	positive	learning and memory significantly impaired
.0325ng/bee	positive	AchE activity much higher
0.24-0.30 ng/bee	positive	hyperactivity - tremors - higher mortality
0.12-0.24 ng/bee	positive	AchE activity much higher
0.809-8.09 ng/bee	positive	apoptosis of brain cells confirmed
2.1 (sugar water)	positive	hypopharyngeal glands significantly smaller
1000 nmol/l	, positive	mortality significantly higher
1000 nmol/l	, positive	mortality significantly higher
1000 nmol/l	, positive	significant impairment of all functions
1000 nmol/l	positive	significant impairment of all functions
295 nM	positive	inhibited ACHe response
200 nM	positive	inhibited ACHe response
1.25 mg/seed	positive	100% mortality with brief dusting
0.1 mg/seed	positive	
0.1 mg/seed	positive	87% mortality with brief dusting
t insecticide/20L of wa	positive	65% mortality with brief dusting
0.25 ml/L	, positive	mortality 4 times higher
0.50 ml/L	, positive	mortality 4 times higher
0.75 ml/L	positive	mortality 4 times higher
5.12 ug/m2	positive	mortality increased over time
5.12 ug/m2 x 3 hours	, positive	mortality increased over time
5.12 ug/m2	positive	mortality increased over time
5.12 ug/m2	positive	colony strength affected
5.12 ug/m2	positive	flight activity higher in treated group
24 ng/larava	positive	significantly different than control. Most removed by nurse bees
24 ng/larava	positive	pupation rates significantly affected
0.	•	· · · ·

2000 ng/larava	positive	eclosion rates significantly affected from 2000 up
0.04 ng/larva	positive	significant olfactory impairment dose dependent
96ppb	positive	Formula was adjusted by Abbot
2.56-51.16	positive	but there were changes in gene expression
1 (4wk)/20 (9wk) µg/l	positive	3 of 4 colonies collapsed at 19-23 weeks
1 (4wk)/ 40 (9wk) μg/	positive	4 of 4 colonies collapsed starting at 16 weeks
3 (4wk)/ 200 (9wk) μg,	positive	All colonies failed
5 (4wk)/ 400 (9wk) µg	positive	All colonies failed between 14 and 18 weeks
50-500 ppb	positive	lower dose no effect/ higher dose strong effect
50-500 ppb	positive	less interaction dose dependent
24 ppb	positive	no difference in foragaging but significant difference in dance
24-241 ppb	positive	Fewer PER responses that were further reduced by dose increase
1.34 ng/bee	positive	significant reduction in homing up to 31% failed to return to hive when hive reg
5-20 ppb	positive	difficulty when exposed to other toxins as compared to controls
118-674 ng/bee	positive	100% mortality in high humidity starting at 20 minutes to 8 hours
30-3661 ng/bee	positive	100% mortality in high humidity
0.15-6ng/bee	positive	number of feeder visits decreased by up to 98%
0.15-6ng/bee	positive	at 3ng, reduced mobility observed
0.15-6ng/bee	positive	trip duration increased by 50% to 130%
0.15-6ng/bee	positive	time spent at feeder increased up to 47%
0.15-6ng/bee	positive	flight time to feeder increased up to 241%
0.15-6ng/bee	positive	flight time to hive increased up to 210%
0.15-6ng/bee	positive	intervals between feedings increased by 33% up to 993% respectively
0.15-6ng/bee	positive	80% fewer bees returned. Demonstrated distended bellies, legs shaking, death
0.5-2 ng/bee	positive	feeder visits reduced significantly
0.5-2 ng/bee	positive	duration of trips significantly affected
0.5-2 ng/bee	positive	time spent at feeder increased by up to 100%
0.5-2 ng/bee	positive	duration of trips significantly affected
1.5-3 ng/bee	positive	intervals between flights significantly increased
1.5-3 ng/bee	positive	time in hive increased
1 g a.i./ha (x≤160 μm)	positive	mortality significantly higher
0.02%	positive	number of visits to flowers reduced
dust	positive	higher mortality, higher queen mortality and lower hive weight
g/seed dust 30 min. e:	positive	50-97% mortality
0.3-0.6 ng/bee	positive	PER significantly affected
400 ppm	positive	high rate of apoptosis
0.5-2 g a.i./ha	positive	mortality increased with dosage
0.5-2 g a.i./ha	positive	risk greatest at edge of field
1 ppb	positive	acini declined by dose
48ng/g	positive	consumption of treated pollen significantly less
48ppb	positive	navigation significantly impaired
48ppb	positive	not significant
27 (14-39) ng/g	positive	colonies contaminated by unknown source of neonics.
7.35 g a.i./ha20%	positive	mortality significantly higher
7.35 g a.i./ha50%	positive	foraging behavior significantly impaired
10mg.l	positive	The AccGtpx-1 gene was induced after treatments with imidacloprid
0.7-70 μg/l	positive	Highest mortality in bees infected with Nosema
5x10-6-1.5x10-3 m/ml	positive	especially high mortality in bees with virus
x10-6-1.5x10-3 m/ml	positive	highest mortality in younger bees
5x10-6-1.5x10-3 m/ml	positive	90% mortality

5x10-6-1.5x10-3 m/ml	positive	younger bees regurgitated but were damaged
500 ng/kg	positive	Decrease in HPG acinal diameter with exposure duration.
0.004-0.008 % a.i.	positive	Activity less with exposure
0.004-0.008 % a.i.	positive	Activity less with exposure
(1.8) (ng/bee)	positive	mortality significantly higher
general exp.	positive	mortality increased over time
unknown	positive	averaged 123 dead bees per colony at day 1
25 g a.i./ha	positive	50% mortality in 24 hours
47 mg/L	positive	wing block within 2 to 6 minutes
200 g/ha	positive	100% mortality after 330 minutes
25.0 g a.i./ha	positive	100%mortality at 0 hours aged residue
25.0 g a.i./ha	positive	87% mortality over two seasons for 1 hour residue
25.0 g a.i./ha	positive	74% mortality for 4 hour residue
25.0 g a.i./ha	positive	64% mortality for 8 hour residue
25.0 g a.i./ha	positive	41% mortality for 24 hour aged residues
25.0 g a.i./ha	positive	22% mortality for 48 hour aged residues
25.0 g a.i./ha	positive	15% mortality for 72 hour aged residues
25.0 g a.i./ha	positive	7.5% mortality for 120 hour aged residues
150 g/100L H2O	positive	71% mortality after 1 hour, 100% mortality after 9 hours
150 g/100L H2O	positive	99% mortality at 24 hours
150 g/100L H2O	positive	56% mortality 1 hour after contact
150 g/100L H2O	positive	100% mortality at 9 hours
0.1-1 ng/bee	positive	"Thiamethoxam by contact induced either a significant decrease of olfac
50-6000 μg/l	positive	At concentrations >1200μg/l, all bees showed abnormal foraging behaviour.
100-300 g a.i./ha	positive	Mortality increased as exposure and dosage increased
15-200 g a.i./ha	positive	Mortality increased as exposure and dosage increased
0.20 mg a.i./ml	positive	100% mortality
0.100 mg a.i./ml	positive	100% mortality
0.02%	positive	69% mortality at 72 hours
30ml/hl - 12 ± 0.5 hl/h	positive	foraging behavior significantly impaired
20ml/hl - 12 ± 0.5 hl/h	positive	sharp decline in foraging followed by partial improvement
0.2 g/litre	positive	number of returning bees greatly affected
48ug/kg	positive	lower food intake in treated group
48ug/kg	positive	significantly less foraging behavior in treated group
0.5-5.0 μg/lin syrup	positive	significant increase in pollen carrying
0.5-5.0 μg/lin syrup	positive	significant difference in capped brood
6 μg/kg	positive	significant difference in activity that was dose and time dependent
1.00.1-10.0 μg/L	positive	significant mortality in all groups
1.00.1-10.0 μg/L	positive	mortality at all levels
24 µg/kg	positive	PER significantly affected
24 µg/kg	positive	foraging behavior significantly impaired
20-50 μg/kg	positive	hyperactivity - tremors - higher mortality
12 ng/bee	positive	significant decrease in performance
0.12-12 ng/bee	positive	A significant increase of CO staining
100-500 ppb	positive	significantly less active
100-500 ppb	positive	effects within 1 hour vanished after 30 hours
100-1000 ppb	positive	100% mortality after 24 hours at higher dosage
0.6-14 g a.i./ha	positive	significant foragaging impairment at higher dosages
110 μM	positive	potent inhibitors (IC50) 1-9 $\mu$ M) of [3H]TCP binding to Apis head membranes,
0.1-1 ng/bee	positive	significant impairment of PER function

10.1-10ng/bee	positive	significant impairment of PER function
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30-240 ug/kg	positive	significantly lower food intake
60-240 ug/kg	positive	significant impairment of PER function
48 ug/kg	positive	significant impairment of PER function
1.5-96 ug/kg	positive	significant impairment of PER function
0.0005-0.05 %	positive	100% mortality at .03%
0.0005-0.05 %	positive	70% mortality at 300 minutes at lowest dose
0.0005-0.05 %	positive	90% mortality at .05%
5 ng/bee	positive	significant loss of sensitivity
1.25-5 ng/bee	positive	significant increase in immobility and loss of coordination
1.25ng/bee	positive	significant impairment of PER function
1.25ng/bee	positive	significant staining observed
1.25-20 ng/bee	positive	significant impairment of PER function
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1-10 ng/bee	positive	significant impairment of PER function
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
8-40ppb	positive	mortality significantly higher
4-40ppb	positive	significant impairment of PER function
50ppb	positive	flight impaired
50ppb	positive	olafactory discrimination fell by 50% but recovered
1-1000ng/bee	positive	100% mortality starting at 200ng/bee
1-1000ng/bee	positive	toxic to all worker bees
50 µg/kg	positive	number of visits declined to 0 during phase 2
25 μg/kg	positive	decrease in consumption of food
3-100 μg/kg	positive	duration of feeding declined
10-8-10-4 M	positive	increased cytochrome oxidase (CO) labelling within 30 min in all the structures
0.727 ng/bee/d	positive	mortality significantly increased with time
20 g a.i./ha	positive	100% mortality at 24 hours
20 g a.i./ha	positive	100% mortality at 2 hours
).0428-0.428 ng a.i./µ	positive	sublethal doses cause damage to brain and midgut
(5x10 -9-5x10 -7) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 -9-5x10 -7) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 -9-5x10 -7) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 -9-5x10 -7) ng a	positive	100% mortality at 150 hours
51.2 ug/m2	positive	high mortality and colony strength decline
not stated	positive	acetylcholinesterase and carboxylesterase significantly decreased
1-2 ng/bee	positive	significant reduction in number of trips
1-2 ng/bee	positive	time to return significantly higher
1-2 ng/bee	positive	number returning declined significiantly
0.7-70 μg/l	positive	highest mortality at 11 days

0.7-70 μg/l	positive	Imidacloprid had a greater effect as the acorns were much more atrophied
0.7-70 μg/kg	positive	mortality increase especially with nosema
7 μg/kg	positive	disease progressed more rapidly in treated group
20-100 ppb	positive	mortality increased with dosage

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1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	locomotor	contact/topical
978	field	clothianidin	mortality	contact/foraging
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	chronic/probiscus extension	contact/topical
1277	field	imidicloprid	colony parameter/collapse	contact foraging maize
895	field	combination of all	colony parameters	contact/foraging
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	sugar respons3	contact/topical
1312	field	imidicloprid	colony parameter	oral/sugar water
1314	lab	thiamethoxam	behavior	contact/topical
689	field	clothianidin	colony parameters	field exposure
1314	lah	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	learning	contact/topical
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
7302	lah	thiamethoxam	mortality	oral/sugar water
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1/72	lab	thiamethoxam	mortality	contact/citrus leaves
5/15	lab	thiamethoxam	mortality	contact/spray
545	lab	thiamethoxam	mortality	oral/sugar water
545	lab	thiamethoxam	mortality	
1022	field	imidicloprid	hebavior/foragaing	oral/sugar water
1922	greenbouse	thiamethoxam	mortality	contact/oral/dust
1239	greennouse	imidicloprid	mortality	
7202	lab	thismothoyam	mortality	oral/sugar water
7302	lab	clothianidin	mortality	contact/film
7260	IdD	CIOUMIdMUM	mortality	
1200	lab	imidicioprid	mortality	
1306	dei dei	thiamethoxam	mortality	contact/leaves
865	field	imidicioprid	mortality	contact/dust
865	field	clothianidin	mortality	contact/dust
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
2160	lab	imidicloprid	mortality	oral/sugar water
143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
143	cage	imidicloprid	mortality	contact/alfalfa
662	field	clothianidin	mortality	contact/dust
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1074	cage	imidicloprid	mortality	oral/pollen
1265	lab	imidicloprid	mortality	all routes
818	field	imidicloprid	colony parameters/collapse	l supplemental for overwir
326	cage	imidicloprid	mortality	contact/alfalfa
818	field	imidicloprid	colony parameters/collapse	l supplemental for overwir
1265	lab	imidicloprid	mortality	all routes
1213	lab	imidicloprid	mortality	contact/filter paper
978	field	clothianidin	mortality	contact/foraging
1306	lab	thiamethoxam	mortality	ontact/contaminated surfact
165	lab	imidicloprid	mortality	all routes
143	cage	imidicloprid	behavior/foraging	field exposure/dandelion

1265	lab	imidicloprid	mortality	all routes
680	field	thiamethoxam	behavior/flower visits	field foraging
165	lab	imidicloprid	mortality	all routes
1644	field	imidicloprid	mortality	contact/foraging
1265	lab	imidicloprid	mortality	all routes
504	lab	imidicloprid	mortality	oral/sugar water
1970	lab	imidicloprid	mortality	oral/solution
1306	lab	thiamethoxam	mortality	spray
1265	lab	imidicloprid	mortality	all routes
868	field	imidicloprid	behavior/homing rates	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
143	cage	imidicloprid	avoidance/food intake	oral/sugar water
1265	lab	imidicloprid	mortality	all routes
662	field	thiamethoxam	mortality	contact/dust
165	lab	imidicloprid	mortality	all routes
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1970	lab	imidicloprid	mortality	oral/solution
143	cage	imidicloprid	mortality	contact/alfalfa
1306	lab	thiamethoxam	mortality	contaminated diet
1845	lab	imidicloprid	histochemestry	oral/sugar water
601	cage	clothianidin	mortality	oral/sugar water
7346	lab	thiamethoxam	Enzymes/AChE activity	contact/acetone sol.
601	cage	imidicloprid	enzymes/aCHe activity	oral/sugar water
601	cage	clothianidin	enzymes/aCHe activity	oral/sugar water
1023	lab	imidicloprid	morphology/acini diameter	oral/sugar water
1164	field	imidicloprid	behavior/activity	contact/foraging
1164	field	thiamethoxam	behavior/activity	contact/foraging
504	lab	imidicloprid	molecular response/gene expression	oral/sugar water
557	lab	clothianidin	immunity/immune response	contact/topical
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
818	field	imidicloprid	colony parameters/collapse	I supplemental for overwir
603	lab	imidicloprid	brain morphology	oral/sugar water
529	lab	imidicloprid	morphology/apoptosis nerve cells	oral
868	field	imidicloprid	behavior/homing	oral/sugar water
1358	field	imidicloprid	behavior/foraging	oral/sugar water
1186	greenhouse	clothianidin	mortality	contact
2139	semi-field	imidicloprid	behavior/foraging	oral/food/honey
1408	lab	thiamethoxam	behavior/locomotion	oral/sugar water
1408	lab	thiamethoxam	behavior/PEReflex	contact/topical
1400	lab	imidicloprid	behavior/foraging	oral/sugar water
788	lab	thiamethoxam	sublethal/biomarkers	contact
1076	field	imidicloprid	colony parameter/collapse	unknown origin
750	semi-field	clothianidin	colony parameter/strength	contact
7303	semi-field	clothianidin	mortality	talc/contact
1074	cage	imidicloprid	chronic food consu.	oral/pollen
533	lab	thiamethoxam	behavior/foraging	oral
2162	Tunnel	imidicloprid	colony parameters/food intake	oral/sugar water
1153	lab	imidicloprid	mortality/neurotoxicy	oral/food
820	lab	imidicloprid	behavior/distance travelled	oral/sugar water
	field	thismothoyam	Behavior/returning hees	contact/foraging mustard

863	field	imidicloprid	colony parameter	oral supplements
7391	lab	imidicloprid	sub-lethal/disease status	oral/sugar water
0	lab	clothianidin	behavior/arching and wing block	oral.guttation fluid
2162	Tunnel	imidicloprid	colony parameters/feeding duration	oral/sugar water
868	field	imidicloprid	behavior/foraging rate	oral/sugar water
868	field	imidicloprid	behavior/foraging/trip duration	oral/sugar water
753	lab	imidicloprid	eclosion rate	into laraval combs
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
1146	lab	thiamethoxam	mortality	oral/honey insecticide
868	field	imidicloprid	behavior/homing	oral/sugar water
823	lab	imidicloprid	behavior/PEReflex	oral
750	semi-field	clothianidin	colony parameter/flight	contact
2159	cage	imidicloprid	behavior/flight	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	clothianidin	behavior/foraging	oral/sugar water
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
1836	semi-field	imidicloprid	behavior/learning	oral/sugar water
758	lab	imidicloprid	mortality	oral/food
758	lab	imidicloprid	mortality	oral/food
7303	semi-field	clothianidin	colony parameter/strength	talc/contact
486	desk	clothianidin	mortality	contact/dust/corn
486	desk	anidin and thiameth	mortality	contact/dust/corn
7302	lab	thiamethoxam	mortality	oral/sugar water
1005	lab	imidicloprid	development/cell death	oral/larval food
920	field	imidicloprid	colony parameter/survival	contact/foraging
7390	lab	imidicloprid	mortality	oral/sugar water
1133	lab	imidicloprid	mortality	oral/sugar water
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
1924	field	imidicloprid	colony parameters	sunflower/field
601	cage	imidicloprid	mortality/hyperactivity	oral/sugar water
1839	lab	imidicloprid	behavior/symptoms	oral/sugar water
612	lab	imidicloprid	ology/Development of hypopharyngea	oral/pollen/sugar water
7390	lab	imidicloprid	logy/Development of hypopharyngeal	oral/sugar water
859	lab	imidicloprid	mortality	contact/topical
535	lab	imidicloprid	behavior/reflex	assumed oral
1146	lab	thiamethoxam	mortality	oral/honey insecticide
2207	lab	imidicloprid	/Densitometric analysis for AL and mu	direct to brain
319	cage	imidicloprid	mortality	contact/alfalfa
654	lab	imidicloprid	acetylcholinesterase activity/brain	not stated
654	lab	imidicloprid	acetylcholinesterase activity/brain	not stated
868	field	imidicloprid	behavior/foraging	oral/sugar water

868	field	imidicloprid	behavior/foraging	oral/sugar water
580	lab	imidicloprid	behavior/learning	oral/honey
1708	cage	imidicloprid	behavior/learning	oral/sugar water
820	lab	imidicloprid	behavior/time in food zone	oral/sugar water
505	lab	clothianidin	behavior/homing	oral/sugar water
534	lab	imidicloprid	behavior/coordination	oral
165	lab	imidicloprid	mortality	all routes
820	lab	imidicloprid	behavior/interaction	oral/sugar water
1708	cage	imidicloprid	food intake	oral/sugar water
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid
697	lab	imidicloprid	mortality	film method
697	lab	imidicloprid	mortality	film method
697	lab	imidicloprid	mortality	film method
1802	lab	mix imidicloprid	mortality	oral/sugar water
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
165	lab	imidicloprid	mortality	all routes
1400	lab	imidicloprid	mortality	oral/sugar water
7391	lab	imidicloprid	mortality	oral/sugar water
1370	field	thiamethoxam	mortality	contact/foraging
1370	field	thiamethoxam	mortality	contact/foraging
750	lab	clothianidin	mortality	contact/leaves
750	lab	clothianidin	mortality	contact/leaves
750	semi-field	clothianidin	mortality	contact
1180	cage	clothianidin	mortality	field exp /potato
1011	semi-field	clothianidin	mortality	contact/oral/dust
7532	field	imidicloprid	hebavior/foraging	oral/sugar water
635	lah	imidicloprid	mortality	oral/sugar water
635	lab	mix - imidiclonrid	mortality	oral/sugar water
88/	semi-field	clothianidin	mortality	contact
1025	field	thiamethoxam	mortality	dust/corp
1171	field	clothianidin	mortality	contact/foraging
105/	lah	imidicloprid	mortality	oral/sugar water
105/	lab	imidicloprid	mortality	oral/sugar water
1054	lab	imidicloprid	mortality	oral/sugar water
21504	lab	imidicloprid	mortality	oral/diat
2159	lab	imidicloprid	mortality	oral/sugar water
2090	lab	matabalita of im	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
2096	lab	metabolite of im.	mortality	oral/sugar water
/242	lab	thiamethoxam	mortality	oral/sugar water
1075	lab	imidicloprid	behavior/navigation	oral/pollen
1312	tield	imidicloprid	mortality	oral/sugar water
750	semi-field	clothianidin	colony parameter/thermoregulation	contact
744	lab	imidicloprid	feeding rate	oral/sugar water

744	lab	imidicloprid	survival/longevity	oral/sugar water
823	lab	imidicloprid	behavior/foraging and waggle dance	oral
1923	semi-field	imidicloprid	mortality	contact and oral
750	semi-field	clothianidin	colony parameter/behavior	contact
143	cage	imidicloprid	behavior/foraging	field exposure/apple
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water
1708	cage	imidicloprid	mortality	oral/sugar water
521	lab	imidicloprid	behavior/feeding	oral/syrup
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
569	field	thiamethoxam	mortality	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
612	lab	imidicloprid	electrophysiology	oral/pollen/sugar water
616	lab	imidicloprid	behavior/avoidance	contact/oral/dust
622	lab	imidicloprid	behavior/reflex	oral/sugar water
622	lab	mix - imidicloprid	behavior/reflex	oral/sugar water
984	lab	imidicloprid	behavior/reflex	oral/sugar water
1075	lab	imidicloprid	behavior/PEReflex	oral/pollen
1118	lab	imidicloprid	ethyl oleate production	oral/sugar water
1133	lab	imidicloprid	immunity/Total baemolymph count	oral/sugar water
1264	field	imidicloprid	colony parameters	contact/foraging
1532	field	clothianidin	colony parameter/weight	contact/foraging canola
1532	field	clothianidin	honey production	contact/foraging canola
1700	lah	imidicloprid	mortality	contact corn tassels
1705	lab	imidicloprid	mortality	contact corn tassels
1700	lab	imidicloprid	mortality	contact corn tassels
1700	lab	clothianidin	mortality	contact corn tassels
1760	field	imidicloprid	hohovior/activity	contact contrassets
1760	field	imidicloprid	mortality	oral/food
1760	field	imidicloprid	colony parameter (weight gain	oral/food
1902	field	imidicloprid	behavior/number forgeing	
1803	field	imidicioprid	benavior/number loraging	ora/sugar water
1934	tield	imidicioprid	hy parameters/summer dev/winter sui	oral/sugar water
1949	lab	metabolite of im.	benavior/PER	oral/sugar water
1954	lab	imidicioprid	mortality	oral/sugar water
1954	lab	imidicloprid	sublethal/food intake	oral/sugar water
1954	lab	metabolite of im.	behavior/PER	oral/sugar water
2183	field	imidicloprid	colony parameters/weight gain	field exposure
2183	field	imidicloprid	slony parameter/number returning be	field exposure
2183	field	imidicloprid	colony parameters/pollen carrying	tield exposure
2183	field	imidicloprid	colony parameters/visits to flowers	tield exposure
2183	field	imidicloprid	pollination/fruit set	field exposure
2183	field	imidicloprid	colony parameter/colony weight	field exposure
2183	field	imidicloprid	colony parameter/colony growth	field exposure
2183	field	imidicloprid	colony parameter/brood nest size	field exposure

2183	field	imidicloprid	colony parameter/comb size	field exposure
2183	field	imidicloprid	olony parameter/number returning be	field exposure
7467	field	imidicloprid	behavior/foraging	contact/brassica
7467	field	imidicloprid	behavior/foraging	contact/brassica
7467	field	imidicloprid	behavior/foraging	contact/brassica
7533	tent		colony parameters/varied	field exposure
868	field	imidicloprid	behavior/foraging	oral/sugar water
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
2162	Tunnel	imidicloprid	ony parameters/visits to feeding static	oral/sugar water
915	field	imidicloprid	behavior/flower visits	contact/foraging
7352	field	thiamethoxam	Behavior/returning bees	oral/sugar water
2159	cage	imidicloprid	behavior/learning	oral/sugar water
1419	lab	imidicloprid	electrophysiology	direct to antenae
984	lab	imidicloprid	behavior/reflex/PER	oral/sugar water
1836	lab	imidicloprid	behavior/reflex	oral/sugar water
1943	lab	imidicloprid	imidicloprid binding site	head membranes
753	lab	imidicloprid	pupation rate	into laraval combs
533	field	thiamethoxam	behavior/foraging	field foraging
1011	semi-field	clothianidin	behavior	contact/oral/dust
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
753	lab	imidicloprid	capped brood rate	into laraval combs
2157	field	imidicloprid	behavior/orientation/foraging	oral/sugar water
2157	field	imidicloprid	behavior/orientation/foraging	oral/sugar water
1845	lab	imidicloprid	behavior/PER	oral/sugar water
1801	semi-field	imidicloprid	behavior/foraging	oral/sugar water
1760	field	imidicloprid	brood development	oral/food
1923	semi-field	imidicloprid	behavior/foraging	contact and oral
635	lab	imidicloprid	behavior/reflex	oral/sugar water
635	lab	mix - imidicloprid	behavio/reflex	oral/sugar water
1949	lab	imidicloprid	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1954	lab	imidicloprid	behavior/PER	oral/sugar water
1954	lab	imidicloprid	behavior/PER	oral/sugar water
1954	lab	imidicloprid	behavior/PER	oral/sugar water
2060	lab	imidicloprid	behavior/PER	contact/topical
2095	lab	imidicloprid	behavior/PER	oral/sugar water
2112	lab	imidicloprid	behavior/PER	contact/topical
2159	lab	imidicloprid	behavior/PER	oral/diet
2060	lab	imidicloprid	behavior/locomotion	contact/topical
1760	field	imidicloprid	behavior/pollen carrying	oral/food
2060	lab	imidicloprid	behavior/gustatory threshold	contact/topical
1802	lab	mix imidicloprid	mortality	oral/sugar water
753	lab	imidicloprid	behavior/probosis extenion/PER	into laraval combs
833	field	thiamethoxam	behavior/homing rate	oral/sugar water
7352	field	thiamethoxam	behavior/foraging	oral/sugar water
533	field	thiamethoxam	behavior/foraging	field foraging
2060	lab	imidicloprid	histochemestry	cranial injection
935	lab	imidicloprid	mortality	oral/sugar water
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
1708	cage	imidicloprid	behavior/foraging	oral/sugar water

1954	lab	imidicloprid	sublethal/food intake	oral/sugar water
783	lab	imidicloprid	genetic change/larval gene expression	oral formula
1888	lab	imidicloprid	effects of long term exposure	oral/sugar water
2183	field	imidicloprid	colony parameter/pollen carrying	field exposure
397	lab	imidicloprid	binding to acetylcholine receptor	
1312	field	imidicloprid	mortality	oral/sugar water
690	field	clothianidin	colony parameters/collapse	maize flower foraging
690	field	imidicloprid	colony parameters/collapse	maize flower foraging
7274	lab	thiamethoxam	Morphology/histochemistry/	oral/sugar water
500	lab	thiamethoxam	organ damage	oral/syrup
557	lab	clothianidin	immunity/immune response	contact/topical
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1107	lab	imidicloprid	genetic/change	oral/sugar water
1408	lab	thiamethoxam	behavior/locomotion/learning	oral/topical
868	field	imidicloprid	behavior/feeding	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
7352	field	thiamethoxam	behavior/returning bees	oral/sugar water
2160	lab	imidicloprid	mortality	oral/sugar water
868	field	imidicloprid	behavior/foraging	oral/sugar water
505	lab	imidicloprid	behavior/homing	oral/sugar water
7556	semi-field	imidicloprid	mortality	contact/leaves alfalfa
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water
557	lab	imidicloprid	immunity/deformed wing virus	oral/sugar water
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid
1236	lab	thiamethoxam	behavior/arching and wing block	oral/guttation fluid
0	lab	clothianidin	behavior/arching and wing block	oral.guttation fluid
0	lab	imidicloprid	behavior/arching and wing block	oral.guttation fluid
1146	lab	thiamethoxam	mortality	oral/honey insecticide
662	field	imidicloprid	mortality	contact/dust
1312	field	imidicloprid	mortality	oral/sugar water
1312	field	imidicloprid	colony parameter	oral/sugar water
1314	lab	thiamethoxam	mortality	oral/sugar water
1408	lab	thiamethoxam	behavior/reflex	topical contact
1532	field	clothianidin	mortality	contact/foraging canola
1532	field	clothianidin	offspring production	contact/foraging canola
1532	field	clothianidin	Over-wintering	contact/foraging canola
2139	semi-field	imidicloprid	honey production	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/weight gain	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/offspring	oral/food/honey

2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidicloprid	mortality	oral/food/honey

0.1-1 ng/bee negative "0.01 ng/bee, honeybees spent significantly more time immobile in an or 0.1-1 ng/bee negative "0.01 ng/bee, honeybees spent significantly more time immobile in an or 1.25 mg/seed dust negative "Chemical analysis showed high quantities of neonicotinoid insecticide in dead 0.1-1 ng/bee negative "Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeyb 0.1-1 ng/bee negative "Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeyb dust negative "However, additional studies are needed to better understand possible synergis varied negative "However, the risk exposure of bee colonies on adverse impact of pestic 0.1-1 ng/bee negative "In the olfactory conditioning paradigm, fipronil-treated honeybees failed 0.1-1 ng/bee negative "In the olfactory conditioning paradigm, fipronil-treated honeybees failed 3.55 ng a.i./L negative "Our observations point towards decays of overall colony vitality for seve 0.1-1 ng/bee negative "Responsiveness to antennal sucrose stimulation was significantly decre JL. 5000x diluted -at 2 negative "The results indicated that clothianidin spraying of the rice field increased the n 0.1-1 ng/bee "Thiamethoxam by contact induced either a significant decrease of olfac negative 0.1-1 ng/bee positive "Thiamethoxam by contact induced either a significant decrease of olfac  $0 \,\mu g/kg$ control 1 of 4 colonies collapsed at 23 weeks (5x10 -9-5x10 -7) ng a positive 100 % mortality at sublethal doses at 234 hours 0.20 mg a.i./ml positive 100% mortality 0.100 mg a.i./ml positive 100% mortality 0.00583 ml/cm2 positive 100% mortality after 1 hour 0.00583 ml/cm2 positive 100% mortality after 1.51 hours 0.00583 ml/cm2 positive 100% mortality after 2.61 hours 100-1000 ppb positive 100% mortality after 24 hours at higher dosage 200 g/ha positive 100% mortality after 330 minutes 0.0005-0.05 % positive 100% mortality at .03% (5x10 -9-5x10 -7) ng a positive 100% mortality at 150 hours 20 g a.i./ha positive 100% mortality at 2 hours 20 g a.i./ha positive 100% mortality at 24 hours 150 g/100L H2O positive 100% mortality at 9 hours 30-3661 ng/bee positive 100% mortality in high humidity 118-674 ng/bee positive 100% mortality in high humidity starting at 20 minutes to 8 hours 25.0 g a.i./ha 100% mortality over two seasons positive 25.0 g a.i./ha positive 100% mortality over two seasons 1-1000ng/bee positive 100% mortality starting at 200ng/bee .028-.28kg a.i./ha positive 100% mortality with 8 hours aged residue .028-.28kg a.i./ha positive 100% mortality with 8 hours aged residue .028-.28kg a.i./ha positive 100% mortality with 8 hours aged residue 1.25 mg/seed positive 100% mortality with brief dusting 25.0 g a.i./ha positive 100% mortality at 0 hours aged residue 25.0 g a.i./ha positive 15% mortality for 72 hour aged residues 48ng/g negative 20% mortality compared to 15% 25.0 g a.i./ha positive 22% mortality for 48 hour aged residues 1 (4wk)/20 (9wk) µg/l positive 3 of 4 colonies collapsed at 19-23 weeks .11kg a.i./ha positive 33% mortality at 2 hours 1 (4wk)/ 40 (9wk) µg/ positive 4 of 4 colonies collapsed starting at 16 weeks 25.0 g a.i./ha positive 41% mortality for 24 hour aged residues 25 g a.i./ha positive 50% mortality in 24 hours g/seed dust 30 min. e: positive 50-97% mortality 150 g/100L H2O positive 56% mortality 1 hour after contact 25.0 g a.i./ha positive 57% mortality with shorter administration 0.112 kg(a.i.)/ ha positive 60% reduction in foraging

25.0 g a.i./ha	positive	64% mortality for 8 hour residue
g insecticide/20L of wa	positive	65% mortality with brief dusting
25.0 g a.i./ha	positive	67% mortality with shorter administration
0.02%	, positive	69% mortality at 72 hours
25.0 g a.i./ha	positive	7.5% mortality for 120 hour aged residues
2 µg/L	, positive	70% increase in mortality in those with parasites
0.0005-0.05 %	positive	70% mortality at 300 minutes at lowest dose
150 g/100L H2O	, positive	71% mortality after 1 hour, 100% mortality after 9 hours
25.0 g a.i./ha	positive	74% mortality for 4 hour residue
0.15-6ng/bee	positive	80% fewer bees returned. Demonstrated distended bellies, legs shaking, death
(5x10 -9-5x10 -7) ng a	positive	80% mortality at 92 hours sub lethal
10 ppm	positive	85% fewer feeding visits
25.0 g a.i./ha	positive	87% mortality over two seasons for 1 hour residue
0.1 mg/seed	positive	87% mortality with brief dusting
25.0 g a i /ha	positive	87% mortality with shorter administration
5x10-6-1.5x10-3 m/ml	positive	90% mortality
0.0005-0.05 %	positive	90% mortality at .05%
028-28kg a i /ha	nositive	97% mortality with 2 hours aged residue
150 g/100L H2O	nositive	99% mortality at 24 hours
0 12-12 ng/hee	nositive	A significant increase of CO staining
03-25ng/hee	negative	abstract says positive for other markers
not stated	nositive	acetylcholinecterase and carboxylesterase significantly decreased
$03_{-}25ng/hee$	positive	Ache activity much higher
0.12-0.24 ng/bee	positive	
0.12-0.24 lig/ bee	positive	activity much higher
	positive	Activity loss with suscesses
	positive	Activity less with exposure
0.004-0.006 % d.i.	positive	
2 µg/L	positive	affected immune related genes
21ng/bee	positive	agonist of acetylcholine receptor disrupts immune response
3 (4wk)/ 200 (9wk) μg/	positive	All colonies failed
5 (4wk)/ 400 (9wk) μg	positive	All colonies failed between 14 and 18 weeks
0.809-8.09 ng/bee	positive	apoptosis of brain cells confirmed
9.9ng/bee	positive	apoptosis of nerve cells confirmed and increased with dosage
0.15-6ng/bee	positive	at 3ng, reduced mobility observed
50-6000 μg/l	positive	At concentrations >1200 $\mu$ g/l, all bees showed abnormal foraging behaviour.
unknown	positive	averaged 123 dead bees per colony at day 1
0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
48 μg/kg(ppb)	negative	But bees took significantly longer to consume sugar water
2.56-51.16	positive	but there were changes in gene expression
27 (14-39) ng/g	positive	colonies contaminated by unknown source of neonics.
5.12 ug/m2	positive	colony strength affected
51.2 ug/m2	borderline	comparing two pesticides
48ng/g	positive	consumption of treated pollen significantly less
1/5 of LD50	positive	could not discriminate between food and non food sources
25 μg/kg	positive	decrease in consumption of food
500 ng/kg	positive	Decrease in HPG acinal diameter with exposure duration.
50-500 ppb	borderline	difference not considered significant
4g/kg seed	negative	difference not considered significant

positive	difficulty when exposed to other toxins as compared to controls
positive	disease progressed more rapidly in treated group
positive	dose dependent
positive	duration of feeding declined
positive	duration of trips significantly affected
positive	duration of trips significantly affected
positive	eclosion rates significantly affected from 2000 up
positive	effects within 1 hour vanished after 30 hours
positive	especially high mortality in bees with virus
positive	feeder visits reduced significantly
positive	Fewer PER responses that were further reduced by dose increase
positive	flight activity higher in treated group
positive	flight impaired
positive	flight time to feeder increased up to 241%
positive	flight time to hive increased up to 210%
positive	foraging behavior significantly impaired
positive	foraging behavior significantly impaired
positive	foraging behavior significantly impaired
positive	Formula was adjusted by Abbot
negative	Formula was adjusted by Abbott and then retested providing stated results
positive	high mortality and colony strength decline
positive	High mortality reported in 2012
positive	High mortality reported in 2012
positive	high mortality with significant motor coordination decline in those living
positive	high rate of apoptosis
positive	higher mortality, higher queen mortality and lower hive weight
positive	highest mortality at 11 days
positive	Highest mortality in bees infected with Nosema
positive	highest mortality in younger bees
negative	hive placed after bloom
negative	hive placed after bloom
negative	hive placed at bloom time
negative	hive placed at bloom time
negative	hive placed at bloom time
negative	hive placed at bloom time
negative	hive placed at bloom time
negative	hive placed at bloom time
negative	hives were placed in field when flowers bloomed not when planted so seed dus
positive	hyperactivity - tremors - higher mortality
positive	hyperactivity - tremors - higher mortality
positive	hypopharyngeal glands significantly smaller
positive	Imidacloprid had a greater effect as the acorns were much more atrophied
borderline	imidicloprid toxicity not affected by diet
positive	impaired sucrose metabolism
negative	In Malpighian tubules treated with insecticide a smaller basophilic was observe
positive	increased cytochrome oxidase (CO) labelling within 30 min in all the structures
positive	increased from 14% to 19% in 2 hours
positive	inhibited ACHe response
positive	inhibited ACHe response
positive	intervals between feedings increased by 33% up to 993% respectively
	positive positive

1.5-3 ng/bee	positive	intervals between flights significantly increased
0.1ug/bee	positive	learning and memory significantly impaired
48ug/kg	borderline	learning impaired but not significant
50-500 ppb	positive	less interaction dose dependent
2.5 ng/bee	positive	longer flight paths
1/100 of LD50	positive	loss of coordination
25.0 g a.i./ha	negative	low mortality if bees exposed 3 days later
50-500 ppb	positive	lower dose no effect/ higher dose strong effect
48ug/kg	positive	lower food intake in treated group
23.3 mg/L	positive	more toxic than clothianidin
0.25 ml/L	positive	mortality 4 times higher
0.50 ml/L	positive	mortality 4 times higher
0.75 ml/L	positive	mortality 4 times higher
1.00.1-10.0 μg/L	positive	mortality at all levels
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
25.0 g a.i./ha	positive	mortality declined when bees were exposed later
48 μg/kg(ppb)	negative	Mortality did not increase
0.7-70 μg/kg	positive	mortality increase especially with nosema
100-300 g a.i./ha	positive	Mortality increased as exposure and dosage increased
15-200 g a.i./ha	positive	Mortality increased as exposure and dosage increased
5.12 ug/m2	positive	mortality increased over time
5.12 ug/m2 x 3 hours	positive	mortality increased over time
5.12 ug/m2	positive	mortality increased over time
general exp.	positive	mortality increased over time
0.5-2 g a.i./ha	positive	mortality increased with dosage
20-100 ppb	positive	mortality increased with dosage
1000 nmol/l	positive	mortality significantly higher
1000 nmol/l	positive	mortality significantly higher
1 g a.i./ha (x≤160 μm)	positive	mortality significantly higher
7.35 g a.i./ha20%	positive	mortality significantly higher
(1.8) (ng/bee)	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
30.6 ng/bee	positive	mortality significantly higher
8-40ppb	positive	mortality significantly higher
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.1 (0.010-1) ng/bee	positive	mortality significantly increased with dosage levels
0.727 ng/bee/d	positive	mortality significantly increased with time
48ppb	positive	navigation significantly impaired
3.55 ng a.i./L	negative	neurotocity determined
5.12 ug/m2	negative	no change in thermoregulation
0.08-125 ug/L	negative	no difference

0.08-125 ug/L	negative	no difference
24 ppb	positive	no difference in foragaging but significant difference in dance
0.6-14 g a.i./ha	negative	no effect
5.12 ug/m2	negative	no significant change
0.112 kg(a.i.)/ ha	negative	no significant difference
.0325ng/bee	negative	no significant difference in mortality
48ug/kg	negative	no significant difference in mortality
125 μg/L	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
12.6 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
88.2 g a.i./ha	negative	not significant
2.1 (sugar water)	negative	not significant
1.28 ng/bee	negative	not significant
1.8ng/bee	negative	not significant
1.8ng/bee	negative	not significant
0.3-0.6 ng/bee	negative	not significant
48ppb	positive	not significant
7 μg/kg	negative	not significant
0.7-70 μg/l	negative	not significant
varied	negative	not significant
32 g a.i./ha	negative	not significant
32 g a.i./ha	negative	not significant
1.6/2,5 g a.i. /kg seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
1.25 mg a.i./seed	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
0.5-5.0 μg/lin syrup	negative	not significant
45.9 g a.i./ha	negative	not significant
0.5-5 ppb	negative	not significant
1ng/bee	negative	not significant
30.6 ng/bee	negative	not significant
1.5-48 ug/kg	negative	not significant
7.5-240 ug/kg	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.3-0.8 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant

0.75 L/ha	negative	not significant
0.75 L/ha	negative	not significant
140 ml/ha	negative	not significant
168 ml/ha	negative	not significant
196 ml/ha	negative	not significant
0.005 g a.i./m2	negative	not significant
0.15-6ng/bee	positive	number of feeder visits decreased by up to 98%
0.2 g/litre	positive	number of returning bees greatly affected
50 µg/kg	positive	number of visits declined to 0 during phase 2
0.02%	positive	number of visits to flowers reduced
1-2 ng/bee	positive	number returning declined significiantly
50ppb	positive	olafactory discrimination fell by 50% but recovered
3.4 μM	borderline	partial agonist of nAChRs on AL neurones,
0.3-0.6 ng/bee	positive	PER significantly affected
24 µg/kg	, positive	PER significantly affected
110 μM	, positive	potent inhibitors (IC50) 1-9 $\mu$ M) of [3H]TCP binding to Apis head membranes,
24 ng/larava	, positive	pupation rates significantly affected
1/50 LD50	positive	return rate significantly lowered
0.5-2 g a.i./ha	positive	risk greatest at edge of field
$20ml/hl - 12 \pm 0.5 hl/h$	positive	sharp decline in foraging followed by partial improvement
24 ng/larava	positive	significantly different than control. Most removed by nurse bees
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
12 ng/bee	positive	significant decrease in performance
8, ∞ee	positive	significant difference in activity that was dose and time dependent
$0.5-5.0 \mu g/lin svrup$	positive	significant difference in capped brood
0.6-14 g a.i./ha	positive	significant foragaging impairment at higher dosages
1000 nmol/l	positive	significant impairment of all functions
1000 nmol/l	positive	significant impairment of all functions
0 1-1 ng/hee	nositive	significant impairment of PER function
10 1-10ng/hee	nositive	significant impairment of PER function
60-240 ug/kg	nositive	significant impairment of PER function
/8 ug/kg	positive	significant impairment of PER function
40 ug/kg 1 5-06 μα/kg	positive	significant impairment of PER function
1.3-30 ug/kg	positive	significant impairment of PER function
1.25.30 pg/bee	positive	significant impairment of PER function
0.1-10 ng/bee	positive	significant impairment of PER function
0.1-10 lig/bee	positive	significant impairment of PER function
4-40ppb	positive	significant impairment of PER function
	positivo	significant increase in miniobility and loss of coordination
0.3-3.0 μg/iiii syrup	positive	significant increase in policin carrying
1 00 1 10 0 ug/l	positivo	significant noss of sensitivity
$1.00.1-10.0 \ \mu g/L$	positive	significant infortanty in an groups
0.04 ng/larva	positive	significant offactory impairment dose dependent
1.34 lig/bee	positive	significant reduction in noming up to 31% failed to return to nive when hive reg
1-2 ng/bee	positive	significant reduction in number of trips
1/10 LD50	positive	significant reduction of motor coordination
1.25Ng/Dee	positive	significant staining observed
ou ng/μι imivi verapai	porderline	significantly higher mortality
100-500 ppb	positive	significantly less active
48ug/kg	positive	significantly less foraging behavior in treated group

30-240 ug/kg	positive	significantly lower food intake
200ppm	negative	significantly more dead than controls
4-8 μg/L	borderline	some changes but not in all endpoints
0.75 L/ha	borderline	some changes but not in all endpoints
2.53 μM (Ki)	positive	Strong binding
3.55 ng a.i./L	negative	study abstract says positive for all but one endpoint
156 mL per 50,000	negative	study reported that there were other plants in the area that are favored over th
/150 mL per 50,000 se	negative	study reported that there were other plants in the area that are favored over th
).0428-0.428 ng a.i./µ	positive	sublethal doses cause damage to brain and midgut
0.0428 ng a.i./L diet	positive	sub-lethal doses cause organ damage while metabolizing the pesticide. Damag
21ng/bee	positive	supressed immune response
1ng/bee	negative	testing use of metabolite
1ng/bee	negative	testing use of metabolite
1ng/bee	negative	testing use of metabolite
10mg.l	positive	The AccGtpx-1 gene was induced after treatments with imidacloprid
0.1-1 ng/bee	negative	THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY REP
1.5-3 ng/bee	positive	time in hive increased
0.5-2 ng/bee	positive	time spent at feeder increased by up to 100%
0.15-6ng/bee	positive	time spent at feeder increased up to 47%
1-2 ng/bee	positive	time to return significantly higher
1-1000ng/bee	positive	toxic to all worker bees
0.15-6ng/bee	positive	trip duration increased by 50% to 130%
7.5-11.25 ng/bee	positive	unable to reach the hive
0.025-0.1 lb a.i./acre	borderline	up to 19% mortality which is more than overwintering
10-30ng/bee	positive	virus replicated faster/dose dependent
10-30ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.02-2 ng/bee	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
0.1-10 ppb	positive	virus replicated faster/dose dependent
1.5-100 mg/L	positive	wing block within 1 hour
47 mg/L	positive	wing block within 2 to 6 minutes
23.3 mg/L	positive	wing block within 2 to 9 minutes
6.25-100 mg/L	positive	wing block within 2 to 9 minutes
5x10-6-1.5x10-3 m/ml	positive	younger bees regurgitated but were damaged
0.1 mg/seed	positive	
3.55 ng a.i./L	negative	
3.55 ng a.i./L	negative	
0.1-1 ng/bee	negative	
0.1-1 ng/bee	negative	
32 g a.i./ha	negative	
32 g a.i./ha	negative	
32 g a.i./ha	negative	
0.002-0.02 mg/kg	negative	
0.002-0.02 mg/kg	negative	
0.002-0.02 mg/kg	negative	

0.002-0.02 mg/kg	negative
0.002-0.02 mg/kg	negative
0.002-0.02 mg/kg	negative
0.002-0.02 mg/kg	negative

pen-field apparatus and ingested significantly more water

pen-field apparatus and ingested significantly more water

bees earlier exposed to dust in the field."

ees after one week of treatment.

ees after one week of treatment.

stic mechanisms between small amounts of pesticide residues within the hive and other potential sources of mortality, such as p ide residues is high in areas of intensively cultivated oilseed rape.

to discriminate between a known and an unknown odorant.

to discriminate between a known and an unknown odorant.

ral hives a couple of weeks after treatment,

eased for high sucrose concentrations in honeybees treated orally with thiamethoxam (1 ng/bee)

nortality of the honeybees, but did not cause colony collapse.

tory memory 24 h after learning at 0.1 ng/bee or a significant impairment of learning performance with no effect on m tory memory 24 h after learning at 0.1 ng/bee or a significant impairment of learning performance with no effect on m

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ORTED THIAMETHOXAM.

bathogens, to better quantify their synergistic effect to honey bee colony health.

nemory at 1 ng/bee nemory at 1 ng/bee