

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
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
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
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	imidicloprid and thiamethoxam	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
521	lab	imidicloprid	behavior/feeding	oral/syrup
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
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	film 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	imidiclopid	behavior/flower visits	contact/foraging
920	field	imidiclopid	colony parameter/survival	contact/foraging
935	lab	imidiclopid	mortality	oral/sugar water
978	field	clothianidin	mortality	contact/foraging
978	field	clothianidin	mortality	contact/foraging
984	lab	imidiclopid	behavior/reflex/PER	oral/sugar water
984	lab	imidiclopid	behavior/reflex	oral/sugar water
1005	lab	imidiclopid	development/cell death	oral/larval food
1011	semi-field	clothianidin	mortality	contact/oral/dust
1011	semi-field	clothianidin	behavior	contact/oral/dust
1023	lab	imidiclopid	morphology/acini diameter	oral/sugar water
1074	cage	imidiclopid	mortality	oral/pollen
1074	cage	imidiclopid	chronic food consu.	oral/pollen
1075	lab	imidiclopid	behavior/navigation	oral/pollen
1075	lab	imidiclopid	behavior/PEReflex	oral/pollen
1076	field	imidiclopid	colony parameter/collapse	unknown origin
1085	field	thiamethoxam	mortality	dust/corn
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
1107	lab	imidiclopid	genetic/change	oral/sugar water
1118	lab	imidiclopid	ethyl oleate production	oral/sugar water
1133	lab	imidiclopid	mortality	oral/sugar water
1133	lab	imidiclopid	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	imidiclopid	mortality/neurotoxicity	oral/food
1164	field	imidiclopid	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	imidiclopid	mortality	contact/filter paper
1236	lab	thiamethoxam	behavior/arching and wing block	oral/guttation fluid
1259	greenhouse	thiamethoxam	mortality	contact/oral/dust
1264	field	imidiclopid	colony parameters	contact/foraging
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1277	field	imidiclopid	colony parameter/collapse	contact foraging maize

1306	lab	thiamethoxam	mortality	spray
1306	lab	thiamethoxam	mortality	contaminated diet
1306	lab	thiamethoxam	mortality	intact/contaminated surfa
1306	lab	thiamethoxam	mortality	contact/leaves
1312	field	imidiclopid	mortality	oral/sugar water
1312	field	imidiclopid	colony parameter	oral/sugar water
1312	field	imidiclopid	mortality	oral/sugar water
1312	field	imidiclopid	colony parameter	oral/sugar water
1312	field	imidiclopid	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	imidiclopid	behavior/foraging	oral/sugar water
1370	field	thiamethoxam	mortality	contact/foraging
1370	field	thiamethoxam	mortality	contact/foraging
1400	lab	imidiclopid	behavior/foraging	oral/sugar water
1400	lab	imidiclopid	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	imidiclopid	electrophysiology	direct to antennae
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	imidiclopid	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	imidiclopid	mortality	oral/sugar water
1708	cage	imidiclopid	food intake	oral/sugar water
1708	cage	imidiclopid	behavior/foraging	oral/sugar water
1708	cage	imidiclopid	behavior/learning	oral/sugar water
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	imidiclopid	mortality	contact corn tassels

1709	lab	imidicloprid	mortality	contact corn tassels
1709	lab	clothianidin	mortality	contact corn tassels
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	histochemistry	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/foraging	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
1924	field	imidicloprid	colony parameters	sunflower/field
1934	field	imidicloprid	ly parameters/summer dev/winter sui	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	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	sublethal/food intake	oral/sugar water
1954	lab	imidicloprid	sublethal/food intake	oral/sugar water
1954	lab	imidicloprid	behavior/PER	oral/sugar water
1954	lab	imidicloprid	behavior/PER	oral/sugar water

1954	lab	metabolite of im.	behavior/PER	oral/sugar water
1954	lab	imidicloprid	behavior/PER	oral/sugar water
1970	lab	imidicloprid	mortality	oral/solution
1970	lab	imidicloprid	mortality	oral/solution
1970	lab	imidicloprid	mortality	oral/solution
2060	lab	imidicloprid	behavior/gustatory threshold	contact/topical
2060	lab	imidicloprid	behavior/locomotion	contact/topical
2060	lab	imidicloprid	behavior/PER	contact/topical
2060	lab	imidicloprid	histochemistry	cranial injection
2095	lab	imidicloprid	behavior/PER	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
2112	lab	imidicloprid	behavior/PER	contact/topical
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
2157	field	imidicloprid	behavior/orientation/foraging	oral/sugar water
2157	field	imidicloprid	behavior/orientation/foraging	oral/sugar water
2159	lab	imidicloprid	mortality	oral/diet
2159	lab	imidicloprid	behavior/PER	oral/diet
2159	cage	imidicloprid	behavior/flight	oral/sugar water
2159	cage	imidicloprid	behavior/learning	oral/sugar water
2160	lab	imidicloprid	mortality	oral/sugar water
2160	lab	imidicloprid	mortality	oral/sugar water
2162	Tunnel	imidicloprid	colony parameters/visits to feeding station	oral/sugar water
2162	Tunnel	imidicloprid	colony parameters/food intake	oral/sugar water
2162	Tunnel	imidicloprid	colony parameters/feeding duration	oral/sugar water
2183	field	imidicloprid	colony parameters/weight gain	field exposure
2183	field	imidicloprid	colony parameter/number returning bees	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	colony parameter/number returning bees	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 hypopharyngeal	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
.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
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
.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
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 water	positive	65% mortality with brief dusting
156 mL per 50,000	negative	"The results indicated that clothianidin spraying of the rice field increased the mortality
/150 mL per 50,000 seeds	negative	study reported that there were other plants in the area that are favored over the treated plants
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	significantly 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
5 (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 foraging 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 re
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
dust	positive	higher mortality, higher queen mortality and lower hive weight
50 ng/μl 1mM verapamil	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
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
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 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
ix10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	especially high mortality in bees with virus
ix10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	highest mortality in younger bees
ix10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	90% mortality
ix10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	younger bees regurgitated but were damaged
ix10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	negative	In Malpighian tubules treated with insecticide a smaller basophilic was observ
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	neurotoxicity 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 >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
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	<b>THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY RE</b>
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
0ml/hl - 12 ± 0.5 hl/h	positive	foraging behavior significantly impaired
0ml/hl - 12 ± 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 food intake in treated group
48ug/kg	positive	significantly less foraging behavior in treated group
48ug/kg	borderline	learning impaired but 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
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 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
0.6-14 g a.i./ha	positive	significant foraging 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
0.24 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
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



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
0.0428-0.428 ng a.i./μ	positive	sublethal doses cause damage to brain and midgut
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) 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 significantly
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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**REPORTED THIAMETHOXAN**

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143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	avoidance/food intake	oral/sugar water
143	cage	imidiclopid	behavior/foraging	field exposure/dandelion
143	cage	imidiclopid	behavior/foraging	field exposure/apple
319	cage	imidiclopid	mortality	contact/alfalfa
326	cage	imidiclopid	mortality	contact/alfalfa
601	cage	clothianidin	mortality	oral/sugar water
601	cage	imidiclopid	enzymes/aChE activity	oral/sugar water
601	cage	imidiclopid	mortality/hyperactivity	oral/sugar water
601	cage	clothianidin	enzymes/aChE activity	oral/sugar water
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water
1074	cage	imidiclopid	mortality	oral/pollen
1074	cage	imidiclopid	chronic food consu.	oral/pollen
1180	cage	clothianidin	mortality	field exp./potato
1708	cage	imidiclopid	mortality	oral/sugar water
1708	cage	imidiclopid	food intake	oral/sugar water
1708	cage	imidiclopid	behavior/foraging	oral/sugar water
1708	cage	imidiclopid	behavior/learning	oral/sugar water
2159	cage	imidiclopid	behavior/flight	oral/sugar water
2159	cage	imidiclopid	behavior/learning	oral/sugar water
486	desk	clothianidin	mortality	contact/dust/corn
486	desk	clothianidin and thiamethoxam	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	imidiclopid	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	imidiclopid	colony parameters/collapse	maize flower foraging
818	field	imidiclopid	colony parameters/collapse	Supplemental for overwintering
818	field	imidiclopid	colony parameters/collapse	Supplemental for overwintering

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
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/foraging	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	colony parameters/summer dev/winter survival	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	colony parameter/number returning bees	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	colony parameter/number returning bees	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	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
397	lab	imidiclopid	binding to acetylcholine receptor	
500	lab	thiamethoxam	organ damage	oral/syrup
504	lab	imidiclopid	mortality	oral/sugar water
504	lab	imidiclopid	molecular response/gene expression	oral/sugar water
505	lab	imidiclopid	behavior/homing	oral/sugar water
505	lab	clothianidin	behavior/homing	oral/sugar water
521	lab	imidiclopid	behavior/feeding	oral/syrup
529	lab	imidiclopid	morphology/apoptosis nerve cells	oral
533	lab	thiamethoxam	behavior/foraging	oral
534	lab	imidiclopid	behavior/coordination	oral
535	lab	imidiclopid	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	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water
557	lab	imidiclopid	immunity/deformed wing virus	oral/sugar water
580	lab	imidiclopid	behavior/learning	oral/honey
603	lab	imidiclopid	brain morphology	oral/sugar water
612	lab	imidiclopid	ology/Development of hypopharyngea	oral/pollen/sugar water
612	lab	imidiclopid	electrophysiology	oral/pollen/sugar water
616	lab	imidiclopid	behavior/avoidance	contact/oral/dust
622	lab	imidiclopid	behavior/reflex	oral/sugar water
622	lab	mix - imidiclopid	behavior/reflex	oral/sugar water
635	lab	imidiclopid	mortality	oral/sugar water
635	lab	mix - imidiclopid	mortality	oral/sugar water
635	lab	imidiclopid	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
697	lab	imidicloprid	mortality	film 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
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
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
859	lab	imidicloprid	mortality	contact/topical
935	lab	imidicloprid	mortality	oral/sugar water
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
1023	lab	imidicloprid	morphology/acini diameter	oral/sugar water
1075	lab	imidicloprid	behavior/navigation	oral/pollen
1075	lab	imidicloprid	behavior/PEReflex	oral/pollen
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/neurotoxicity	oral/food
1213	lab	imidicloprid	mortality	contact/filter paper
1236	lab	thiamethoxam	behavior/arching and wing block	oral/guttation fluid
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes
1265	lab	imidicloprid	mortality	all routes



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
1954	lab	imidicloprid	sublethal/food intake	oral/sugar water
1954	lab	imidicloprid	sublethal/food intake	oral/sugar water
1954	lab	imidicloprid	behavior/PER	oral/sugar water
1954	lab	imidicloprid	behavior/PER	oral/sugar water
1954	lab	metabolite of im.	behavior/PER	oral/sugar water
1954	lab	imidicloprid	behavior/PER	oral/sugar water
1970	lab	imidicloprid	mortality	oral/solution
1970	lab	imidicloprid	mortality	oral/solution
1970	lab	imidicloprid	mortality	oral/solution
2060	lab	imidicloprid	behavior/gustatory threshold	contact/topical
2060	lab	imidicloprid	behavior/locomotion	contact/topical
2060	lab	imidicloprid	behavior/PER	contact/topical
2060	lab	imidicloprid	histochemistry	cranial injection
2095	lab	imidicloprid	behavior/PER	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
2112	lab	imidicloprid	behavior/PER	contact/topical
2159	lab	imidicloprid	mortality	oral/diet
2159	lab	imidicloprid	behavior/PER	oral/diet
2160	lab	imidicloprid	mortality	oral/sugar water
2160	lab	imidicloprid	mortality	oral/sugar water
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
7346	lab	thiamethoxam	Enzymes/AChE activity	contact/acetone sol.
7390	lab	imidicloprid	mortality	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
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
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	talca/contact
7303	semi-field	clothianidin	colony parameter/strength	talca/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	colony parameters/visits to feeding station	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	olfactory 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
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
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 water	positive	65% mortality with brief dusting
20L, 5000x diluted -at 2	negative	"The results indicated that clothianidin spraying of the rice field increased the mortality of the bees"
156 mL per 50,000	negative	study reported that there were other plants in the area that are favored over tobacco
/150 mL per 50,000 seeds	negative	study reported that there were other plants in the area that are favored over tobacco
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
1.34 ng/bee	positive	significant reduction in homing up to 31% failed to return to hive when hive re-
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	neurotoxicity 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 >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
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
0.24 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 significantly
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. Damage
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
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	significantly 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 foraging 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 verapamil	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
1x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	especially high mortality in bees with virus
1x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	highest mortality in younger bees
1x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	90% mortality
1x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	younger bees regurgitated but were damaged
1x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	negative	In Malpighian tubules treated with insecticide a smaller basophilic was observed
500 ng/kg	positive	Decrease in HPG acinar 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	<b>THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY RE</b>
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 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
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 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) 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

5.12 ug/m <sup>2</sup>	negative	no significant change
5.12 ug/m <sup>2</sup>	positive	flight activity higher in treated group
1 g a.i./ha (x≤160 μm)	positive	mortality significantly 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
6 μg/kg	positive	significant difference in activity that was dose and time dependent
24 μg/kg	positive	foraging behavior significantly impaired
0.6-14 g a.i./ha	positive	significant foraging impairment at higher dosages
0.6-14 g a.i./ha	negative	no effect
0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
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0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
0.002-0.02 mg/kg	negative	Bayer Agriculture Center Study
51.2 ug/m <sup>2</sup>	borderline	comparing two pesticides
51.2 ug/m <sup>2</sup>	positive	high mortality and colony strength decline
0.025-0.1 lb a.i./acre	borderline	up to 19% mortality which is more than overwintering
0.005 g a.i./m <sup>2</sup>	negative	not significant
10ml/hl - 12 ± 0.5 hl/h	positive	foraging behavior significantly impaired
10ml/hl - 12 ± 0.5 hl/h	positive	sharp decline in foraging followed by partial improvement
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

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**REPORTED THIAMETHOXAM**

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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 immune response
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	.03-.25ng/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	.03-.25ng/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 spraying of the rice field increased the mortality
690	field	clothianidin	colony parameters/collapse	maize flower foraging	156 mL per 50,000	negative	study reported that there were other plants in the area that are favored over the maize
750	lab	clothianidin	mortality	contact/leaves	5.12 ug/m2	positive	mortality increased over time
750	lab	clothianidin	mortality	contact/leaves	5.12 ug/m2 x 3 hours	positive	mortality increased over time
750	semi-field	clothianidin	mortality	contact	5.12 ug/m2	positive	mortality increased over time
750	semi-field	clothianidin	colony parameter/strength	contact	5.12 ug/m2	positive	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/behavior	contact	5.12 ug/m2	negative	no significant change
750	semi-field	clothianidin	colony parameter/flight	contact	5.12 ug/m2	positive	flight activity higher in treated group
865	field	clothianidin	mortality	contact/dust	118-674 ng/bee	positive	100% mortality in high humidity starting at 20 minutes to 8 hours
868	field	clothianidin	behavior/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./ha (x≤160 μm)	positive	mortality significantly higher
978	field	clothianidin	mortality	contact/foraging	1.25 mg/seed dust	negative	"Chemical analysis showed high quantities of neonicotinoid insecticide in dead bees
978	field	clothianidin	mortality	contact/foraging	ng/seed dust 30 min. exl	positive	50-97% mortality
1011	semi-field	clothianidin	mortality	contact/oral/dust	0.5-2 g a.i./ha	positive	mortality increased with dosage
1011	semi-field	clothianidin	behavior	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
1180	cage	clothianidin	mortality	field exp./potato	general exp.	positive	mortality increased over time
1186	greenhouse	clothianidin	mortality	contact	unknown	positive	averaged 123 dead bees per colony at day 1
1532	field	clothianidin	colony parameter/weight	contact/foraging canola	32 g a.i./ha	negative	not significant
1532	field	clothianidin	honey production	contact/foraging canola	32 g a.i./ha	negative	not significant
1532	field	clothianidin	mortality	contact/foraging canola	32 g a.i./ha	negative	
1532	field	clothianidin	offspring production	contact/foraging canola	32 g a.i./ha	negative	
1532	field	clothianidin	Over-wintering	contact/foraging canola	32 g a.i./ha	negative	
1709	lab	clothianidin	mortality	contact corn tassels	1.25 mg a.i./seed	negative	not significant
7260	lab	clothianidin	mortality	contact/film	20 g a.i./ha	positive	100% mortality at 2 hours
7303	semi-field	clothianidin	mortality	talc/contact	51.2 ug/m2	borderline	comparing two pesticides
7303	semi-field	clothianidin	colony parameter/strength	talca/contact	51.2 ug/m2	positive	high mortality and colony strength decline
486	desk	clothianidin and thiamethoxam	mortality	contact/dust/corn	field exposure	positive	High mortality reported in 2012
895	field	combination of all	colony parameters	contact/foraging	varied	negative	"However, the risk exposure of bee colonies on adverse impact
0	lab	imidicloprid	behavior/arching and wing block	oral.guttation fluid	6.25-100 mg/L	positive	wing block within 2 to 9 minutes
143	cage	imidicloprid	mortality	contact/alfalfa	.028-.28kg a.i./ha	positive	97% mortality with 2 hours aged residue
143	cage	imidicloprid	mortality	contact/alfalfa	.028-.28kg a.i./ha	positive	100% mortality with 8 hours aged residue
143	cage	imidicloprid	mortality	contact/alfalfa	.028-.28kg a.i./ha	positive	100% mortality with 8 hours aged residue
143	cage	imidicloprid	mortality	contact/alfalfa	.028-.28kg a.i./ha	positive	100% mortality with 8 hours aged residue
143	cage	imidicloprid	avoidance/food intake	oral/sugar water	10 ppm	positive	85% fewer feeding visits
143	cage	imidicloprid	behavior/foraging	field exposure/dandelion	0.112 kg(a.i.)/ ha	positive	60% reduction in foraging
143	cage	imidicloprid	behavior/foraging	field 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

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/syrup	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 with dosage
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	positive	virus replicated faster/dose dependent
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical	0.1-10 ppb	positive	virus replicated faster/dose dependent
557	lab	imidicloprid	immunity/deformed wing virus	contact/topical	0.02-2 ng/bee	positive	virus replicated faster/dose dependent
557	lab	imidicloprid	immunity/deformed wing virus	oral/sugar water	0.1-10 ppb	positive	virus replicated faster/dose dependent
580	lab	imidicloprid	behavior/learning	oral/honey	0.1ug/bee	positive	learning and memory significantly impaired
601	cage	imidicloprid	enzymes/aChE activity	oral/sugar water	.03-.25ng/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	brain morphology	oral/sugar water	0.809-8.09 ng/bee	positive	apoptosis of brain cells confirmed
612	lab	imidicloprid	morphology/Development of hypopharyngeal glands	oral/pollen/sugar water	2.1 (sugar water)	positive	hypopharyngeal glands significantly smaller
612	lab	imidicloprid	electrophysiology	oral/pollen/sugar water	2.1 (sugar water)	negative	not significant
616	lab	imidicloprid	behavior/avoidance	contact/oral/dust	1.28 ng/bee	negative	not significant
622	lab	imidicloprid	behavior/reflex	oral/sugar water	1.8ng/bee	negative	not significant
635	lab	imidicloprid	mortality	oral/sugar water	1000 nmol/l	positive	mortality significantly higher
635	lab	imidicloprid	behavior/reflex	oral/sugar water	1000 nmol/l	positive	significant impairment of all functions
654	lab	imidicloprid	acetylcholinesterase activity/brain	not stated	295 nM	positive	inhibited AChE response
654	lab	imidicloprid	acetylcholinesterase activity/brain	not stated	200 nM	positive	inhibited AChE response
662	field	imidicloprid	mortality	contact/dust	0.1 mg/seed	positive	
690	field	imidicloprid	colony parameters/collapse	maize flower foraging	3/150 mL per 50,000 seeds	negative	study reported that there were other plants in the area that are favored over the maize
697	lab	imidicloprid	mortality	film method	0.25 ml/L	positive	mortality 4 times higher
697	lab	imidicloprid	mortality	film method	0.50 ml/L	positive	mortality 4 times higher
697	lab	imidicloprid	mortality	film method	0.75 ml/L	positive	mortality 4 times higher
744	lab	imidicloprid	feeding rate	oral/sugar water	0.08-125 ug/L	negative	no difference
744	lab	imidicloprid	survival/longevity	oral/sugar water	0.08-125 ug/L	negative	no difference
753	lab	imidicloprid	capped brood rate	into laraval combs	24 ng/larava	positive	significantly different than control. Most removed by nurse bees
753	lab	imidicloprid	pupation rate	into laraval combs	24 ng/larava	positive	pupation rates significantly affected
753	lab	imidicloprid	eclosion rate	into laraval combs	2000 ng/larava	positive	eclosion rates significantly affected from 2000 up
753	lab	imidicloprid	behavior/probosis extension/PER	into laraval combs	0.04 ng/larava	positive	significant olfactory impairment dose dependent
758	lab	imidicloprid	mortality	oral/food	68ppb	negative	Formula was adjusted by Abbott and then retested providing stated results
758	lab	imidicloprid	mortality	oral/food	96ppb	positive	Formula was adjusted by Abbot
783	lab	imidicloprid	genetic change/larval gene expression	oral formula	200ppm	negative	significantly more dead than controls
818	field	imidicloprid	colony parameters/collapse	oral supplemental for overwinter	0 µg/kg	control	1 of 4 colonies collapsed at 23 weeks
818	field	imidicloprid	colony parameters/collapse	oral supplemental for overwinter	0.1 (4wk)/20 (9wk) µg/kg	positive	3 of 4 colonies collapsed at 19-23 weeks
818	field	imidicloprid	colony parameters/collapse	oral supplemental for overwinter	1.1 (4wk)/ 40 (9wk) µg/kg	positive	4 of 4 colonies collapsed starting at 16 weeks
818	field	imidicloprid	colony parameters/collapse	oral supplemental for overwinter	3 (4wk)/ 200 (9wk) µg/kg	positive	All colonies failed
818	field	imidicloprid	colony parameters/collapse	oral supplemental for overwinter	5 (4wk)/ 400 (9wk) µg/kg	positive	All colonies failed between 14 and 18 weeks

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 foraging but significant difference in dance
823	lab	imidicloprid	behavior/PEReflex	oral	24-241 ppb	positive	Fewer PER responses that were further reduced by dose increase
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 compared to controls
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 993% respectively
868	field	imidicloprid	behavior/homing rates	oral/sugar water	0.15-6ng/bee	positive	80% fewer bees returned. Demonstrated distended bellies, legs shaking, death
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 hive weight
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 neonics.
1107	lab	imidicloprid	genetic/change	oral/sugar water	10mg.l	positive	The AccGtpx-1 gene was induced after treatments with imidacloprid
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/neurotoxicity	oral/food	500 ng/kg	positive	Decrease in HPG acinal diameter with exposure duration.
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 understandcolony health.
1312	field	imidicloprid	mortality	oral/sugar water	3.55 ng a.i./L	negative	neurotoicity determined
1312	field	imidicloprid	colony parameter	oral/sugar water	3.55 ng a.i./L	negative	"Our observations point towards decays of overall colony
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

1358	field	imidicloprid	behavior/foraging	oral/sugar water	50-6000 µg/l	positive	At concentrations >1200µg/l, all bees showed abnormal foraging behaviour.
1400	lab	imidicloprid	behavior/foraging	oral/sugar water	48 µg/kg(ppb)	negative	But bees took significantly longer to consume sugar water
1400	lab	imidicloprid	mortality	oral/sugar water	48 µg/kg(ppb)	negative	Mortality did not increase
1419	lab	imidicloprid	electrophysiology	direct to antennae	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 time dependent
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	histochemistry	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/foraging	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 foraging 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 not when planted so seed dust not present
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
1924	field	imidicloprid	colony parameters	sunflower/field	0.24 mg/seed	negative	hive placed at bloom time
1934	field	imidicloprid	colony parameters/summer dev/winter survi	oral/sugar water	0.5-5 ppb	negative	not significant
1943	lab	imidicloprid	imidicloprid binding site	head membranes	110 µM	positive	potent inhibitors (IC50) 1-9 µM) of [3H]TCP binding to Apis head membranes,
1949	lab	imidicloprid	behavior/PER	oral/sugar water	0.1-1 ng/bee	positive	significant impairment of PER function
1954	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
1954	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	negative	not significant
1954	lab	imidicloprid	sublethal/food intake	oral/sugar water	1.5-48 ug/kg	negative	not significant
1954	lab	imidicloprid	sublethal/food intake	oral/sugar water	30-240 ug/kg	positive	significantly lower food intake
1954	lab	imidicloprid	behavior/PER	oral/sugar water	60-240 ug/kg	positive	significant impairment of PER function
1954	lab	imidicloprid	behavior/PER	oral/sugar water	48 ug/kg	positive	significant impairment of PER function
1954	lab	imidicloprid	behavior/PER	oral/sugar water	1.5-96 ug/kg	positive	significant impairment of PER function
1970	lab	imidicloprid	mortality	oral/solution	0.0005-0.05 %	positive	100% mortality at .03%
1970	lab	imidicloprid	mortality	oral/solution	0.0005-0.05 %	positive	70% mortality at 300 minutes at lowest dose
1970	lab	imidicloprid	mortality	oral/solution	0.0005-0.05 %	positive	90% mortality at .05%
2060	lab	imidicloprid	behavior/gustatory threshold	contact/topical	5 ng/bee	positive	significant loss of sensitivity

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	histochemistry	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/honey	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	
2139	semi-field	imidicloprid	colony parameter/brood dev.	oral/food/honey	0.002-0.02 mg/kg	negative	
2139	semi-field	imidicloprid	mortality	oral/food/honey	0.002-0.02 mg/kg	negative	
2157	field	imidicloprid	behavior/orientation/foraging	oral/sugar water	10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
2157	field	imidicloprid	behavior/orientation/foraging	oral/sugar water	10-100ppb	positive	significant changes in endpoints measured starting at 20ppb
2159	lab	imidicloprid	mortality	oral/diet	8-40ppb	positive	mortality significantly higher
2159	lab	imidicloprid	behavior/PER	oral/diet	4-40ppb	positive	significant impairment of PER function
2159	cage	imidicloprid	behavior/flight	oral/sugar water	50ppb	positive	flight impaired
2159	cage	imidicloprid	behavior/learning	oral/sugar water	50ppb	positive	olfactory discrimination fell by 50% but recovered
2160	lab	imidicloprid	mortality	oral/sugar water	1-1000ng/bee	positive	100% mortality starting at 200ng/bee
2160	lab	imidicloprid	mortality	oral/sugar water	1-1000ng/bee	positive	toxic to all worker bees
2162	Tunnel	imidicloprid	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 must	direct to brain	10-8-10-4 M	positive	increased cytochrome oxidase (CO) labelling within 30 min in all the structures analysed.
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	imidicloprid had a greater effect as the acorns were much more atrophied
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/bee	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/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
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 metabolizing the pesticide. Damage can reverse
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 sources
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 bees	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
569	field	thiamethoxam	colony parameter/hive weight	flower foraging	88.2 g a.i./ha	negative	not significant
662	field	thiamethoxam	mortality	contact/dust	0.1 mg/seed	positive	87% mortality with brief dusting
680	field	thiamethoxam	behavior/flower visits	field foraging	µg insecticide/20L of wat	positive	65% mortality with brief dusting
788	lab	thiamethoxam	sublethal/biomarkers	contact	2.56-51.16	positive	but there were changes in gene expression
833	field	thiamethoxam	behavior/homing rate	oral/sugar water	1.34 ng/bee	positive	significant reduction in homing up to 31% failed to return to hive when hive regularly treated
1085	field	thiamethoxam	mortality	dust/corn	7.35 g a.i./ha20%	positive	mortality significantly higher
1085	field	thiamethoxam	behavior/foraging	contact with corn dust	7.35 g a.i./ha50%	positive	foraging behavior significantly impaired
1146	lab	thiamethoxam	mortality	oral/honey insecticide	5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/mlg	positive	especially high mortality in bees with virus
1146	lab	thiamethoxam	mortality	oral/honey insecticide	5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/mlg	positive	highest mortality in younger bees
1146	lab	thiamethoxam	mortality	oral/honey insecticide	5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/mlg	positive	90% mortality
1146	lab	thiamethoxam	mortality	oral/honey insecticide	5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/mlg	positive	younger bees regurgitated but were damaged
1146	lab	thiamethoxam	mortality	oral/honey insecticide	5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/mlg	negative	In Malpighian tubules treated with insecticide a smaller basophilic was observed
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 hours
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, induced mortality of all
1314	lab	thiamethoxam	behavior	oral/sugar water	0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
1314	lab	thiamethoxam	behavior	oral/sugar water	0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees
1314	lab	thiamethoxam	behavior	oral/sugar water	0.1-1 ng/bee	negative	"Thiamethoxam by contact induced either a significant decrease of olfactory memory
1314	lab	thiamethoxam	behavior	contact/topical	0.1-1 ng/bee	negative	"Responsiveness to antennal sucrose stimulation was significantly decreased
1314	lab	thiamethoxam	chronic/probiscus extension	contact/topical	0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all
1314	lab	thiamethoxam	locomotor	contact/topical	0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
1314	lab	thiamethoxam	sugar respons3	contact/topical	0.1-1 ng/bee	negative	"In the olfactory conditioning paradigm, fipronil-treated honeybees failed to discriminate

1314	lab	thiamethoxam	learning	contact/topical	0.1-1 ng/bee	positive	"Thiamethoxam by contact induced either a significant decrease of olfactory memory
1370	field	thiamethoxam	mortality	contact/foraging	100-300 g a.i./ha	positive	Mortality increased as exposure and dosage increased
1370	field	thiamethoxam	mortality	contact/foraging	15-200 g a.i./ha	positive	Mortality increased as exposure and dosage increased
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	<b>THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY REPORTED THIAMETHOXAM.</b>
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 improvement
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 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng ai/	positive	100 % mortality at sublethal doses at 234 hours
7302	lab	thiamethoxam	mortality	oral/sugar water	7 (5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng ai/	positive	80% mortality at 92 hours sub lethal
7302	lab	thiamethoxam	mortality	oral/sugar water	7 (5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng ai/	positive	high mortality with significant motor coordination decline in those living
7302	lab	thiamethoxam	mortality	oral/sugar water	7 (5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng ai/	positive	100% mortality at 150 hours
7346	lab	thiamethoxam	Enzymes/AChE activity	contact/acetone sol.	not stated	positive	acetylcholinesterase and carboxylesterase significantly decreased
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 significantly
7533	tent	thiamethoxam	colony parameters/varied	field exposure	0.005 g a.i./m2	negative	not significant

654	lab	imidiclopid	acetylcholinesterase activity/brain	not stated
654	lab	imidiclopid	acetylcholinesterase activity/brain	not stated
143	cage	imidiclopid	avoidance/food intake	oral/sugar water
635	lab	mix - imidiclopid	behavior/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	imidiclopid	behavior/activity	contact/foraging
1164	field	thiamethoxam	behavior/activity	contact/foraging
1760	field	imidiclopid	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	imidiclopid	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	imidiclopid	behavior/avoidance	contact/oral/dust
534	lab	imidiclopid	behavior/coordination	oral
820	lab	imidiclopid	behavior/distance travelled	oral/sugar water
868	field	imidiclopid	behavior/feeding	oral/sugar water
521	lab	imidiclopid	behavior/feeding	oral/syrup
2159	cage	imidiclopid	behavior/flight	oral/sugar water
915	field	imidiclopid	behavior/flower visits	contact/foraging
680	field	thiamethoxam	behavior/flower visits	field foraging
1922	field	imidiclopid	behavior/foraging	oral/sugar water
1923	semi-field	imidiclopid	behavior/foraging	contact and oral
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
7467	field	imidiclopid	behavior/foraging	contact/brassica
7467	field	imidiclopid	behavior/foraging	contact/brassica
7467	field	imidiclopid	behavior/foraging	contact/brassica
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
143	cage	imidiclopid	behavior/foraging	field exposure/apple
143	cage	imidiclopid	behavior/foraging	field exposure/dandelion
533	field	thiamethoxam	behavior/foraging	field foraging
533	field	thiamethoxam	behavior/foraging	field foraging
533	lab	thiamethoxam	behavior/foraging	oral
2139	semi-field	imidiclopid	behavior/foraging	oral/food/honey
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	clothianidin	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
1358	field	imidiclopid	behavior/foraging	oral/sugar water

1400	lab	imidiclopid	behavior/foraging	oral/sugar water
1708	cage	imidiclopid	behavior/foraging	oral/sugar water
1801	semi-field	imidiclopid	behavior/foraging	oral/sugar water
7352	field	thiamethoxam	behavior/foraging	oral/sugar water
7532	field	imidiclopid	behavior/foraging	oral/sugar water
823	lab	imidiclopid	behavior/foraging and waggle dance	oral
868	field	imidiclopid	behavior/foraging rate	oral/sugar water
868	field	imidiclopid	behavior/foraging/trip duration	oral/sugar water
2060	lab	imidiclopid	behavior/gustatory threshold	contact/topical
505	lab	imidiclopid	behavior/homing	oral/sugar water
505	lab	clothianidin	behavior/homing	oral/sugar water
868	field	imidiclopid	behavior/homing	oral/sugar water
868	field	imidiclopid	behavior/homing	oral/sugar water
833	field	thiamethoxam	behavior/homing rate	oral/sugar water
868	field	imidiclopid	behavior/homing rates	oral/sugar water
820	lab	imidiclopid	behavior/interaction	oral/sugar water
580	lab	imidiclopid	behavior/learning	oral/honey
1708	cage	imidiclopid	behavior/learning	oral/sugar water
1836	semi-field	imidiclopid	behavior/learning	oral/sugar water
2159	cage	imidiclopid	behavior/learning	oral/sugar water
2060	lab	imidiclopid	behavior/locomotion	contact/topical
1408	lab	thiamethoxam	behavior/locomotion	oral/sugar water
1408	lab	thiamethoxam	behavior/locomotion/learning	oral/topical
1075	lab	imidiclopid	behavior/navigation	oral/pollen
1803	field	imidiclopid	behavior/number foraging	ora/sugar water
2157	field	imidiclopid	behavior/orientation/foraging	oral/sugar water
2157	field	imidiclopid	behavior/orientation/foraging	oral/sugar water
2060	lab	imidiclopid	behavior/PER	contact/topical
2112	lab	imidiclopid	behavior/PER	contact/topical
2159	lab	imidiclopid	behavior/PER	oral/diet
1949	lab	imidiclopid	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	imidiclopid	behavior/PER	oral/sugar water
1954	lab	imidiclopid	behavior/PER	oral/sugar water
1954	lab	metabolite of im.	behavior/PER	oral/sugar water
1954	lab	imidiclopid	behavior/PER	oral/sugar water
2095	lab	imidiclopid	behavior/PER	oral/sugar water
1845	lab	imidiclopid	behavior/PER	oral/sugar water
1408	lab	thiamethoxam	behavior/PEReflex	contact/topical
823	lab	imidiclopid	behavior/PEReflex	oral
1075	lab	imidiclopid	behavior/PEReflex	oral/pollen
1760	field	imidiclopid	behavior/pollen carrying	oral/food
753	lab	imidiclopid	behavior/probosis extenion/PER	into laraval combs
535	lab	imidiclopid	behavior/reflex	assumed oral
622	lab	imidiclopid	behavior/reflex	oral/sugar water
622	lab	mix - imidiclopid	behavior/reflex	oral/sugar water

635	lab	imidiclopid	behavior/reflex	oral/sugar water
984	lab	imidiclopid	behavior/reflex	oral/sugar water
1836	lab	imidiclopid	behavior/reflex	oral/sugar water
1408	lab	thiamethoxam	behavior/reflex	topical contact
984	lab	imidiclopid	behavior/reflex/PER	oral/sugar water
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
7352	field	thiamethoxam	behavior/returning bees	oral/sugar water
7352	field	thiamethoxam	Behavior/returning bees	oral/sugar water
1839	lab	imidiclopid	behavior/symptoms	oral/sugar water
820	lab	imidiclopid	behavior/time in food zone	oral/sugar water
397	lab	imidiclopid	binding to acetylcholine receptor	
603	lab	imidiclopid	brain morphology	oral/sugar water
1760	field	imidiclopid	brood development	oral/food
753	lab	imidiclopid	capped brood rate	into laraval combs
1074	cage	imidiclopid	chronic food consu.	oral/pollen
1314	lab	thiamethoxam	chronic/probiscus extension	contact/topical
863	field	imidiclopid	colony parameter	oral supplements
1312	field	imidiclopid	colony parameter	oral/sugar water
1312	field	imidiclopid	colony parameter	oral/sugar water
750	semi-field	clothianidin	colony parameter/behavior	contact
2139	semi-field	imidiclopid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/brood dev.	oral/food/honey
2183	field	imidiclopid	colony parameter/brood nest size	field exposure
1277	field	imidiclopid	colony parameter/collapse	contact foraging maize
1076	field	imidiclopid	colony parameter/collapse	unknown origin
2183	field	imidiclopid	colony parameter/colony growth	field exposure
2183	field	imidiclopid	colony parameter/colony weight	field exposure
2183	field	imidiclopid	colony parameter/comb size	field exposure
750	semi-field	clothianidin	colony parameter/flight	contact
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/food	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
569	field	thiamethoxam	colony parameter/hive weight	flower foraging
2183	field	imidiclopid	colony parameter/number returning bees	field exposure
2183	field	imidiclopid	colony parameter/number returning bees	field exposure
2139	semi-field	imidiclopid	colony parameter/offspring	oral/food/honey
2183	field	imidiclopid	colony parameter/pollen carrying	field exposure
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
569	field	thiamethoxam	colony parameter/returning bees	flower foraging
750	semi-field	clothianidin	colony parameter/strength	contact
569	field	thiamethoxam	colony parameter/strength	flower foraging
569	field	thiamethoxam	colony parameter/strength	flower foraging
7303	semi-field	clothianidin	colony parameter/strength	talc/contact
920	field	imidiclopid	colony parameter/survival	contact/foraging
750	semi-field	clothianidin	colony parameter/thermoregulation	contact
1532	field	clothianidin	colony parameter/weight	contact/foraging canola
1760	field	imidiclopid	colony parameter/weight gain	oral/food
2139	semi-field	imidiclopid	colony parameter/weight gain	oral/food/honey

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

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

1472	lab	thiamethoxam	mortality	contact/citrus leaves
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1306	lab	thiamethoxam	mortality	contact/contaminated surface
662	field	clothianidin	mortality	contact/dust
662	field	imidicloprid	mortality	contact/dust
662	field	thiamethoxam	mortality	contact/dust
865	field	clothianidin	mortality	contact/dust
865	field	imidicloprid	mortality	contact/dust
486	desk	clothianidin	mortality	contact/dust/corn
486	desk	clothianidin and thiamethoxam	mortality	contact/dust/corn
7260	lab	imidicloprid	mortality	contact/film
7260	lab	clothianidin	mortality	contact/film
1213	lab	imidicloprid	mortality	contact/filter paper
978	field	clothianidin	mortality	contact/foraging
978	field	clothianidin	mortality	contact/foraging
1171	field	clothianidin	mortality	contact/foraging
1370	field	thiamethoxam	mortality	contact/foraging
1370	field	thiamethoxam	mortality	contact/foraging
1644	field	imidicloprid	mortality	contact/foraging
1532	field	clothianidin	mortality	contact/foraging canola
750	lab	clothianidin	mortality	contact/leaves
750	lab	clothianidin	mortality	contact/leaves
1306	lab	thiamethoxam	mortality	contact/leaves
545	lab	thiamethoxam	mortality	contact/leaves
7556	semi-field	imidicloprid	mortality	contact/leaves alfalfa
1011	semi-field	clothianidin	mortality	contact/oral/dust
1259	greenhouse	thiamethoxam	mortality	contact/oral/dust
545	lab	thiamethoxam	mortality	contact/spray
859	lab	imidicloprid	mortality	contact/topical
1306	lab	thiamethoxam	mortality	contaminated diet
1085	field	thiamethoxam	mortality	dust/corn
1180	cage	clothianidin	mortality	field exp./potato
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	mortality	flower foraging
2159	lab	imidicloprid	mortality	oral/diet
758	lab	imidicloprid	mortality	oral/food
758	lab	imidicloprid	mortality	oral/food
1760	field	imidicloprid	mortality	oral/food
2139	semi-field	imidicloprid	mortality	oral/food/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
1074	cage	imidicloprid	mortality	oral/pollen
1970	lab	imidicloprid	mortality	oral/solution
1970	lab	imidicloprid	mortality	oral/solution

1970	lab	imidiclopid	mortality	oral/solution
504	lab	imidiclopid	mortality	oral/sugar water
545	lab	thiamethoxam	mortality	oral/sugar water
601	cage	clothianidin	mortality	oral/sugar water
635	lab	imidiclopid	mortality	oral/sugar water
635	lab	mix - imidiclopid	mortality	oral/sugar water
935	lab	imidiclopid	mortality	oral/sugar water
1133	lab	imidiclopid	mortality	oral/sugar water
1312	field	imidiclopid	mortality	oral/sugar water
1312	field	imidiclopid	mortality	oral/sugar water
1312	field	imidiclopid	mortality	oral/sugar water
1314	lab	thiamethoxam	mortality	oral/sugar water
1400	lab	imidiclopid	mortality	oral/sugar water
1708	cage	imidiclopid	mortality	oral/sugar water
1802	lab	mix imidiclopid	mortality	oral/sugar water
1802	lab	mix imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
2096	lab	imidiclopid	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	imidiclopid	mortality	oral/sugar water
2160	lab	imidiclopid	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	imidiclopid	mortality	oral/sugar water
7391	lab	imidiclopid	mortality	oral/sugar water
1306	lab	thiamethoxam	mortality	spray
7303	semi-field	clothianidin	mortality	talco/contact
601	cage	imidiclopid	mortality/hyperactivity	oral/sugar water
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water
1153	lab	imidiclopid	mortality/neurotoxicity	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	imidiclopid	pollination/fruit set	field exposure
753	lab	imidiclopid	pupation rate	into larval combs
1921	lab	imidiclopid	sublethal/activities	oral/sugar water
1921	lab	imidiclopid	sublethal/activities	oral/sugar water
788	lab	thiamethoxam	sublethal/biomarkers	contact
7391	lab	imidiclopid	sub-lethal/disease status	oral/sugar water

1954	lab	imidiclopid	sublethal/food intake	oral/sugar water
1954	lab	imidiclopid	sublethal/food intake	oral/sugar water
1314	lab	thiamethoxam	sugar respons3	contact/topical
744	lab	imidiclopid	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 discrimin
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
3 insecticide/20L of water	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 foraging impairment at higher dosages
7.35 g a.i./ha	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
30ml/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 >1200µg/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 foraging 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 treated
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 µg/kg	positive	foraging behavior significantly impaired
50ppb	positive	olfactory 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	<b>THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY REPORTED TI</b>
48ppb	positive	navigation significantly impaired
45.9 g a.i./ha	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
1.25ng/bee	positive	significant impairment of PER function
0.1-10 ng/bee	positive	significant impairment of PER function
4-40ppb	positive	significant impairment of PER function
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
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
12 ng/bee	positive	significant decrease in performance
0.1-1 ng/bee	negative	behavior not significantly affected at this dose
24-241 ppb	positive	Fewer PER responses that were further reduced by dose increase
48ppb	positive	not significant
0.5-5.0 µg/lin syrup	positive	significant increase in pollen carrying
0.04 ng/larva	positive	significant olfactory impairment dose dependent
1/5 of LD50	positive	impaired sucrose metabolism
1.8ng/bee	negative	not significant
1.8ng/bee	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 significantly
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	significantly 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
0.1, 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 s	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/l	positive	4 of 4 colonies collapsed starting at 16 weeks
3 (4wk)/ 200 (9wk) µg/l	positive	All colonies failed
5 (4wk)/ 400 (9wk) µg/l	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./m <sup>2</sup>	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
.03-.25ng/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 (IC <sub>50</sub> ) 1-9 µM) 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

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
21ng/bee	positive	supressed immune response
21ng/bee	positive	agonist of acetylcholine receptor disrupts immune response
0.7-70 µg/l	negative	not significant
0.1-1 ng/bee	positive	"Thiamethoxam by contact induced either a significant decrease of olfactory mem
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile
2 µg/L	positive	affected immune related genes
0.7-70 µg/l	positive	Imidacloprid had a greater effect as the acorns were much more atrophied
1 ppb	positive	acini declined by dose
9.9ng/bee	positive	apoptosis of nerve cells confirmed and increased with dosage
2.1 (sugar water)	positive	hypopharyngeal glands significantly smaller
.0428-0.428 ng a.i./µl	positive	sublethal doses cause damage to brain and midgut
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
5.12 ug/m2	positive	mortality increased over time
1 g a.i./ha (x≤160 µm)	positive	mortality significantly higher
unknown	positive	averaged 123 dead bees per colony at day 1
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
.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
.168kg a.i./ha	positive	increased from 14% to 19% in 2 hours
.11kg a.i./ha	positive	33% mortality at 2 hours

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	imidiclopid 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	
ix10-6-1.5x10-3 m/ml;	positive	especially high mortality in bees with virus
ix10-6-1.5x10-3 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 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/cm <sup>2</sup>	positive	100% mortality after 1.51 hours
.03-.25ng/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	neurotoxicity 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 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) 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 H <sub>2</sub> O	positive	71% mortality after 1 hour, 100% mortality after 9 hours
51.2 ug/m <sup>2</sup>	borderline	comparing two pesticides
0.24-0.30 ng/bee	positive	hyperactivity - tremors - higher mortality
.03-.25ng/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 discrimin
0.08-125 ug/L	negative	no difference

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165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
535	lab	imidiclopid	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	lab	thiamethoxam	sublethal/biomarkers	contact
1923	semi-field	imidiclopid	behavior/foraging	contact and oral
1923	semi-field	imidiclopid	mortality	contact and oral
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	clothianidin	mortality	contact corn tassels
1277	field	imidiclopid	colony parameter/collapse	contact foraging maize
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
7346	lab	thiamethoxam	Enzymes/AChE activity	contact/acetone sol.
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	mortality	contact/alfalfa
319	cage	imidiclopid	mortality	contact/alfalfa
326	cage	imidiclopid	mortality	contact/alfalfa
7467	field	imidiclopid	behavior/foraging	contact/brassica
7467	field	imidiclopid	behavior/foraging	contact/brassica
7467	field	imidiclopid	behavior/foraging	contact/brassica
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1306	lab	thiamethoxam	mortality	contact/contaminated surfa
662	field	clothianidin	mortality	contact/dust

662	field	imidiclopid	mortality	contact/dust
662	field	thiamethoxam	mortality	contact/dust
865	field	clothianidin	mortality	contact/dust
865	field	imidiclopid	mortality	contact/dust
486	desk	clothianidin	mortality	contact/dust/corn
486	desk	anidin and thiametf	mortality	contact/dust/corn
7260	lab	imidiclopid	mortality	contact/film
7260	lab	clothianidin	mortality	contact/film
1213	lab	imidiclopid	mortality	contact/filter paper
895	field	combination of all	colony parameters	contact/foraging
915	field	imidiclopid	behavior/flower visits	contact/foraging
920	field	imidiclopid	colony parameter/survival	contact/foraging
978	field	clothianidin	mortality	contact/foraging
978	field	clothianidin	mortality	contact/foraging
1164	field	imidiclopid	behavior/activity	contact/foraging
1164	field	thiamethoxam	behavior/activity	contact/foraging
1171	field	clothianidin	mortality	contact/foraging
1264	field	imidiclopid	colony parameters	contact/foraging
1370	field	thiamethoxam	mortality	contact/foraging
1370	field	thiamethoxam	mortality	contact/foraging
1644	field	imidiclopid	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
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
750	lab	clothianidin	mortality	contact/leaves
750	lab	clothianidin	mortality	contact/leaves
1306	lab	thiamethoxam	mortality	contact/leaves
545	lab	thiamethoxam	mortality	contact/leaves
7556	semi-field	imidiclopid	mortality	contact/leaves alfalfa
616	lab	imidiclopid	behavior/avoidance	contact/oral/dust
1011	semi-field	clothianidin	mortality	contact/oral/dust
1011	semi-field	clothianidin	behavior	contact/oral/dust
1259	greenhouse	thiamethoxam	mortality	contact/oral/dust
545	lab	thiamethoxam	mortality	contact/spray
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	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
859	lab	imidiclopid	mortality	contact/topical
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/PEReflex	contact/topical
2060	lab	imidiclopid	behavior/gustatory threshold	contact/topical
2060	lab	imidiclopid	behavior/locomotion	contact/topical
2060	lab	imidiclopid	behavior/PER	contact/topical
2112	lab	imidiclopid	behavior/PER	contact/topical
1306	lab	thiamethoxam	mortality	contaminated diet
2060	lab	imidiclopid	histochemistry	cranial injection
1419	lab	imidiclopid	electrophysiology	direct to antennae
2207	lab	imidiclopid	/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	behavior/foraging	field exposure
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
2183	field	imidiclopid	colony parameters/weight gain	field exposure
2183	field	imidiclopid	colony parameter/number returning bees	field exposure
2183	field	imidiclopid	colony parameters/pollen carrying	field exposure
2183	field	imidiclopid	colony parameters/visits to flowers	field exposure
2183	field	imidiclopid	pollination/fruit set	field exposure
2183	field	imidiclopid	colony parameter/colony weight	field exposure
2183	field	imidiclopid	colony parameter/colony growth	field exposure
2183	field	imidiclopid	colony parameter/brood nest size	field exposure
2183	field	imidiclopid	colony parameter/comb size	field exposure
2183	field	imidiclopid	colony parameter/number returning bees	field exposure
2183	field	imidiclopid	colony parameter/pollen carrying	field exposure
7533	tent		colony parameters/varied	field exposure
143	cage	imidiclopid	behavior/foraging	field exposure/apple
143	cage	imidiclopid	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	imidiclopid	mortality	film method
697	lab	imidiclopid	mortality	film method
697	lab	imidiclopid	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	imidiclopid	imidiclopid binding site	head membranes
753	lab	imidiclopid	capped brood rate	into laraval combs

753	lab	imidiclopid	pupation rate	into laraval combs
753	lab	imidiclopid	eclosion rate	into laraval combs
753	lab	imidiclopid	behavior/probosis extenion/PER	into laraval combs
690	field	clothianidin	colony parameters/collapse	maize flower foraging
690	field	imidiclopid	colony parameters/collapse	maize flower foraging
654	lab	imidiclopid	acetylcholinesterase activity/brain	not stated
654	lab	imidiclopid	acetylcholinesterase activity/brain	not stated
1803	field	imidiclopid	behavior/number foraging	ora/sugar water
529	lab	imidiclopid	morphology/apoptosis nerve cells	oral
533	lab	thiamethoxam	behavior/foraging	oral
534	lab	imidiclopid	behavior/coordination	oral
823	lab	imidiclopid	behavior/foraging and waggle dance	oral
823	lab	imidiclopid	behavior/PEReflex	oral
783	lab	imidiclopid	genetic change/larval gene expression	oral formula
818	field	imidiclopid	colony parameters/collapse	l supplemental for overwir
818	field	imidiclopid	colony parameters/collapse	l supplemental for overwir
818	field	imidiclopid	colony parameters/collapse	l supplemental for overwir
818	field	imidiclopid	colony parameters/collapse	l supplemental for overwir
818	field	imidiclopid	colony parameters/collapse	l supplemental for overwir
863	field	imidiclopid	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	imidiclopid	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	imidiclopid	mortality	oral/diet
2159	lab	imidiclopid	behavior/PER	oral/diet
758	lab	imidiclopid	mortality	oral/food
758	lab	imidiclopid	mortality	oral/food
1153	lab	imidiclopid	mortality/neurotoxicity	oral/food
1760	field	imidiclopid	behavior/activity	oral/food
1760	field	imidiclopid	mortality	oral/food
1760	field	imidiclopid	colony parameter/weight gain	oral/food
1760	field	imidiclopid	behavior/pollen carrying	oral/food
1760	field	imidiclopid	brood development	oral/food
2139	semi-field	imidiclopid	behavior/foraging	oral/food/honey
2139	semi-field	imidiclopid	honey production	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/weight gain	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/offspring	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidiclopid	mortality	oral/food/honey
1236	lab	thiamethoxam	behavior/arching and wing block	oral/guttation fluid
580	lab	imidiclopid	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	imidiclopid	development/cell death	oral/larval food
1074	cage	imidiclopid	mortality	oral/pollen
1074	cage	imidiclopid	chronic food consu.	oral/pollen
1075	lab	imidiclopid	behavior/navigation	oral/pollen
1075	lab	imidiclopid	behavior/PEReflex	oral/pollen
612	lab	imidiclopid	biology/Development of hypopharyngea	oral/pollen/sugar water
612	lab	imidiclopid	electrophysiology	oral/pollen/sugar water
1970	lab	imidiclopid	mortality	oral/solution
1970	lab	imidiclopid	mortality	oral/solution
1970	lab	imidiclopid	mortality	oral/solution
143	cage	imidiclopid	avoidance/food intake	oral/sugar water
504	lab	imidiclopid	mortality	oral/sugar water
504	lab	imidiclopid	molecular response/gene expression	oral/sugar water
505	lab	imidiclopid	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	imidiclopid	immunity/deformed wing virus	oral/sugar water
601	cage	clothianidin	mortality	oral/sugar water
601	cage	imidiclopid	enzymes/aChE activity	oral/sugar water
601	cage	imidiclopid	mortality/hyperactivity	oral/sugar water
601	cage	clothianidin	enzymes/aChE activity	oral/sugar water
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water
603	lab	imidiclopid	brain morphology	oral/sugar water
622	lab	imidiclopid	behavior/reflex	oral/sugar water
622	lab	mix - imidiclopid	behavior/reflex	oral/sugar water
635	lab	imidiclopid	mortality	oral/sugar water
635	lab	mix - imidiclopid	mortality	oral/sugar water
635	lab	imidiclopid	behavior/reflex	oral/sugar water
635	lab	mix - imidiclopid	behavio/reflex	oral/sugar water
744	lab	imidiclopid	feeding rate	oral/sugar water
744	lab	imidiclopid	survival/longevity	oral/sugar water
820	lab	imidiclopid	behavior/distance travelled	oral/sugar water
820	lab	imidiclopid	behavior/interaction	oral/sugar water
820	lab	imidiclopid	behavior/time in food zone	oral/sugar water
833	field	thiamethoxam	behavior/homing rate	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/homing	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	clothianidin	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/homing rates	oral/sugar water
868	field	imidiclopid	behavior/homing	oral/sugar water
868	field	imidiclopid	behavior/foraging rate	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging/trip duration	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/feeding	oral/sugar water

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

1954	lab	imidiclopid	sublethal/food intake	oral/sugar water
1954	lab	imidiclopid	behavior/PER	oral/sugar water
1954	lab	imidiclopid	behavior/PER	oral/sugar water
1954	lab	metabolite of im.	behavior/PER	oral/sugar water
1954	lab	imidiclopid	behavior/PER	oral/sugar water
2095	lab	imidiclopid	behavior/PER	oral/sugar water
2096	lab	imidiclopid	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
2157	field	imidiclopid	behavior/orientation/foraging	oral/sugar water
2157	field	imidiclopid	behavior/orientation/foraging	oral/sugar water
2159	cage	imidiclopid	behavior/flight	oral/sugar water
2159	cage	imidiclopid	behavior/learning	oral/sugar water
2160	lab	imidiclopid	mortality	oral/sugar water
2160	lab	imidiclopid	mortality	oral/sugar water
2162	Tunnel	imidiclopid	ony parameters/visits to feeding static	oral/sugar water
2162	Tunnel	imidiclopid	colony parameters/food intake	oral/sugar water
2162	Tunnel	imidiclopid	colony parameters/feeding duration	oral/sugar water
7242	lab	thiamethoxam	mortality	oral/sugar water
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
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	imidiclopid	mortality	oral/sugar water
7390	lab	imidiclopid	ology/Development of hypopharyngeal	oral/sugar water
7391	lab	imidiclopid	mortality	oral/sugar water
7391	lab	imidiclopid	sub-lethal/disease status	oral/sugar water
7532	field	imidiclopid	behavior/foraging	oral/sugar water
500	lab	thiamethoxam	organ damage	oral/syrup
521	lab	imidiclopid	behavior/feeding	oral/syrup
1408	lab	thiamethoxam	behavior/locomotion/learning	oral/topical
1306	lab	thiamethoxam	mortality	spray
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
7303	semi-field	clothianidin	mortality	talco/contact

7303	semi-field	clothianidin	colony parameter/strength	talc/contact
1408	lab	thiamethoxam	behavior/reflex	topical contact
1076	field	imidiclopid	colony parameter/collapse	unknown origin
397	lab	imidiclopid	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/m <sup>2</sup>	positive	mortality increased over time
5.12 ug/m <sup>2</sup>	positive	colony strength affected
5.12 ug/m <sup>2</sup>	negative	no change in thermoregulation
5.12 ug/m <sup>2</sup>	negative	no significant change
5.12 ug/m <sup>2</sup>	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 foraging 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
.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
.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 H <sub>2</sub> O	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
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
g/seed dust 30 min. e:	positive	50-97% mortality
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
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	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
0.2 g/litre	positive	number of returning bees greatly affected
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
1.28 ng/bee	negative	not significant
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
200 g/ha	positive	100% mortality after 330 minutes
0.00583 ml/cm2	positive	100% mortality after 1 hour
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
0.005-0.03 µg/bee	borderline	imidicloprid toxicity not affected by diet
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 discrimin
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
20L, 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
30ml/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
3 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 µM) of [3H]TCP binding to Apis head membranes,
24 ng/larava	positive	significantly 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/larava	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 s	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 foraging 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
3 (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	
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	
47 mg/L	positive	wing block within 2 to 6 minutes
0.1ug/bee	positive	learning and memory significantly impaired
ix10-6-1.5x10-3 m/ml;	positive	especially high mortality in bees with virus
ix10-6-1.5x10-3 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 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
.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
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 trea
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 verapamil	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	neurotoxicity 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 discriminate
0.1-1 ng/bee	negative	"Thiamethoxam by contact induced either a significant decrease of olfactory memory
50-6000 μg/l	positive	At concentrations >1200μg/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	olfactory 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
0.0428-0.428 ng a.i./µl	positive	sublethal doses cause damage to brain and midgut
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) 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 significantly
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	<b>THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY REPORTED TI</b>
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

51.2 ug/m <sup>2</sup>	positive	high mortality and colony strength decline
0.1-1 ng/bee	negative	
27 (14-39) ng/g	positive	colonies contaminated by unknown source of neonics.
2.53 μM (Ki)	positive	Strong binding

mechanisms of mortality, such as pathogens, to better quantify their synergistic effect to honey bee colony health



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) THIAMETHOXAM

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818	field	imidiclopid	colony parameters/collapse	I supplemental for overwir
662	field	imidiclopid	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	imidiclopid	behavior/PER	oral/sugar water
2112	lab	imidiclopid	behavior/PER	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water
557	lab	imidiclopid	immunity/deformed wing virus	oral/sugar water
143	cage	imidiclopid	behavior/foraging	field exposure/dandelion
143	cage	imidiclopid	behavior/foraging	field exposure/apple
601	cage	clothianidin	enzymes/aChE activity	oral/sugar water
1845	lab	imidiclopid	histochemistry	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/homing	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	clothianidin	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/homing rates	oral/sugar water
580	lab	imidiclopid	behavior/learning	oral/honey
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
601	cage	imidiclopid	mortality/hyperactivity	oral/sugar water
697	lab	imidiclopid	mortality	film method

984	lab	imidiclopid	behavior/reflex/PER	oral/sugar water
984	lab	imidiclopid	behavior/reflex	oral/sugar water
2183	field	imidiclopid	colony parameters/weight gain	field exposure
2183	field	imidiclopid	colony parameter/number returning be	field exposure
2183	field	imidiclopid	colony parameters/pollen carrying	field exposure
2183	field	imidiclopid	colony parameters/visits to flowers	field exposure
2183	field	imidiclopid	pollination/fruit set	field exposure
697	lab	imidiclopid	mortality	film method
1011	semi-field	clothianidin	mortality	contact/oral/dust
1011	semi-field	clothianidin	behavior	contact/oral/dust
868	field	imidiclopid	behavior/homing	oral/sugar water
868	field	imidiclopid	behavior/foraging rate	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging/trip duration	oral/sugar water
1934	field	imidiclopid	colony parameters/summer dev/winter sur	oral/sugar water
1760	field	imidiclopid	behavior/activity	oral/food
1760	field	imidiclopid	mortality	oral/food
1760	field	imidiclopid	colony parameter/weight gain	oral/food
1760	field	imidiclopid	behavior/pollen carrying	oral/food
1760	field	imidiclopid	brood development	oral/food
1923	semi-field	imidiclopid	behavior/foraging	contact and oral
1923	semi-field	imidiclopid	mortality	contact and oral
7242	lab	thiamethoxam	mortality	oral/sugar water
2183	field	imidiclopid	colony parameter/colony weight	field exposure
2183	field	imidiclopid	colony parameter/colony growth	field exposure
2183	field	imidiclopid	colony parameter/brood nest size	field exposure
2183	field	imidiclopid	colony parameter/comb size	field exposure
2183	field	imidiclopid	colony parameter/number returning be	field exposure
2183	field	imidiclopid	colony parameter/pollen carrying	field exposure
697	lab	imidiclopid	mortality	film method
7391	lab	imidiclopid	mortality	oral/sugar water
1133	lab	imidiclopid	mortality	oral/sugar water
1133	lab	imidiclopid	immunity/Total haemolymph count	oral/sugar water
7390	lab	imidiclopid	mortality	oral/sugar water
7390	lab	imidiclopid	biology/Development of hypopharyngeal	oral/sugar water
603	lab	imidiclopid	brain morphology	oral/sugar water
884	semi-field	clothianidin	mortality	contact
1023	lab	imidiclopid	morphology/acini diameter	oral/sugar water
1802	lab	mix imidiclopid	mortality	oral/sugar water
1802	lab	mix imidiclopid	mortality	oral/sugar water
818	field	imidiclopid	colony parameters/collapse	supplemental for overwir
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	clothianidin	mortality	contact corn tassels
662	field	clothianidin	mortality	contact/dust
2095	lab	imidiclopid	behavior/PER	oral/sugar water
2060	lab	imidiclopid	behavior/locomotion	contact/topical
2060	lab	imidiclopid	behavior/PER	contact/topical
2060	lab	imidiclopid	histochemistry	cranial injection
616	lab	imidiclopid	behavior/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	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/feeding	oral/sugar water
1954	lab	imidiclopid	sublethal/food intake	oral/sugar water
1954	lab	imidiclopid	behavior/PER	oral/sugar water
1709	lab	imidiclopid	mortality	contact corn tassels
622	lab	imidiclopid	behavior/reflex	oral/sugar water
622	lab	mix - imidiclopid	behavior/reflex	oral/sugar water
533	field	thiamethoxam	behavior/foraging	field foraging
534	lab	imidiclopid	behavior/coordination	oral
533	lab	thiamethoxam	behavior/foraging	oral
535	lab	imidiclopid	behavior/reflex	assumed oral
533	field	thiamethoxam	behavior/foraging	field foraging
143	cage	imidiclopid	avoidance/food intake	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
818	field	imidiclopid	colony parameters/collapse	l supplemental for overwir
635	lab	imidiclopid	mortality	oral/sugar water
635	lab	mix - imidiclopid	mortality	oral/sugar water
635	lab	imidiclopid	behavior/reflex	oral/sugar water
635	lab	mix - imidiclopid	behavio/reflex	oral/sugar water
1922	field	imidiclopid	behavior/foragaing	oral/sugar water
1370	field	thiamethoxam	mortality	contact/foraging
1921	lab	imidiclopid	sublethal/activities	oral/sugar water
1921	lab	imidiclopid	sublethal/activities	oral/sugar water
2157	field	imidiclopid	behavior/orientation/foraging	oral/sugar water
2157	field	imidiclopid	behavior/orientation/foraging	oral/sugar water
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
2207	lab	imidiclopid	/Densitometric analysis for AL and mu	direct to brain
1107	lab	imidiclopid	genetic/change	oral/sugar water
1943	lab	imidiclopid	imidiclopid binding site	head membranes
2160	lab	imidiclopid	mortality	oral/sugar water
2160	lab	imidiclopid	mortality	oral/sugar water
865	field	clothianidin	mortality	contact/dust
1845	lab	imidiclopid	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	imidiclopid	behavior/feeding	oral/syrup
7467	field	imidiclopid	behavior/foraging	contact/brassica
1306	lab	thiamethoxam	mortality	spray
1306	lab	thiamethoxam	mortality	contaminated diet
1306	lab	thiamethoxam	mortality	contact/contaminated surfa
1306	lab	thiamethoxam	mortality	contact/leaves

1370	field	thiamethoxam	mortality	contact/foraging
690	field	clothianidin	colony parameters/collapse	maize flower foraging
7467	field	imidiclopid	behavior/foraging	contact/brassica
7467	field	imidiclopid	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	imidiclopid	mortality	oral/sugar water
504	lab	imidiclopid	molecular response/gene expression	oral/sugar water
612	lab	imidiclopid	biology/Development of hypopharyngea	oral/pollen/sugar water
612	lab	imidiclopid	electrophysiology	oral/pollen/sugar water
505	lab	clothianidin	behavior/homing	oral/sugar water
397	lab	imidiclopid	binding to acetylcholine receptor	
788	lab	thiamethoxam	sublethal/biomarkers	contact
7260	lab	imidiclopid	mortality	contact/film
7260	lab	clothianidin	mortality	contact/film
1259	greenhouse	thiamethoxam	mortality	contact/oral/dust
654	lab	imidiclopid	acetylcholinesterase activity/brain	not stated
753	lab	imidiclopid	eclosion rate	into laraval combs
783	lab	imidiclopid	genetic change/larval gene expression	oral formula
7532	field	imidiclopid	behavior/foraging	oral/sugar water
1839	lab	imidiclopid	behavior/symptoms	oral/sugar water
680	field	thiamethoxam	behavior/flower visits	field foraging
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
557	lab	clothianidin	immunity/immune response	contact/topical
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	imidiclopid	capped brood rate	into laraval combs
753	lab	imidiclopid	pupation rate	into laraval combs
823	lab	imidiclopid	behavior/foraging and waggle dance	oral
1836	lab	imidiclopid	behavior/reflex	oral/sugar water
1836	semi-field	imidiclopid	behavior/learning	oral/sugar water
823	lab	imidiclopid	behavior/PEReflex	oral
1213	lab	imidiclopid	mortality	contact/filter paper
2162	Tunnel	imidiclopid	colony parameters/food intake	oral/sugar water
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes

1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
689	field	clothianidin	colony parameters	field exposure
1076	field	imidiclopid	colony parameter/collapse	unknown origin
654	lab	imidiclopid	acetylcholinesterase activity/brain	not stated
1419	lab	imidiclopid	electrophysiology	direct to antennae
1312	field	imidiclopid	mortality	oral/sugar water
1312	field	imidiclopid	colony parameter	oral/sugar water
1312	field	imidiclopid	mortality	oral/sugar water
1312	field	imidiclopid	colony parameter	oral/sugar water
1312	field	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	sublethal/food intake	oral/sugar water
865	field	imidiclopid	mortality	contact/dust
1687	Tunnel	thiamethoxam	behavior/foraging	field exposure
2162	Tunnel	imidiclopid	colony parameters/feeding duration	oral/sugar water
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
1005	lab	imidiclopid	development/cell death	oral/larval food
2159	lab	imidiclopid	behavior/PER	oral/diet
1803	field	imidiclopid	behavior/number foraging	ora/sugar water
1236	lab	thiamethoxam	behavior/arching and wing block	oral/guttation fluid
1954	lab	imidiclopid	behavior/PER	oral/sugar water
1400	lab	imidiclopid	behavior/foraging	oral/sugar water
1400	lab	imidiclopid	mortality	oral/sugar water
1888	lab	imidiclopid	effects of long term exposure	oral/sugar water
1074	cage	imidiclopid	mortality	oral/pollen
1074	cage	imidiclopid	chronic food consu.	oral/pollen
1075	lab	imidiclopid	behavior/navigation	oral/pollen
1075	lab	imidiclopid	behavior/PEReflex	oral/pollen
1708	cage	imidiclopid	mortality	oral/sugar water
1708	cage	imidiclopid	food intake	oral/sugar water
1708	cage	imidiclopid	behavior/foraging	oral/sugar water
1708	cage	imidiclopid	behavior/learning	oral/sugar water
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
2060	lab	imidiclopid	behavior/gustatory threshold	contact/topical
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
750	lab	clothianidin	mortality	contact/leaves
818	field	imidiclopid	colony parameters/collapse	l supplemental for overwir
2162	Tunnel	imidiclopid	ony parameters/visits to feeding static	oral/sugar water
1153	lab	imidiclopid	mortality/neurotoxicity	oral/food
820	lab	imidiclopid	behavior/distance travelled	oral/sugar water
820	lab	imidiclopid	behavior/interaction	oral/sugar water
820	lab	imidiclopid	behavior/time in food zone	oral/sugar water
1358	field	imidiclopid	behavior/foraging	oral/sugar water
2159	cage	imidiclopid	behavior/flight	oral/sugar water
2159	cage	imidiclopid	behavior/learning	oral/sugar water
7303	semi-field	clothianidin	mortality	talco/contact
7303	semi-field	clothianidin	colony parameter/strength	talco/contact
863	field	imidiclopid	colony parameter	oral supplements
935	lab	imidiclopid	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	imidiclopid	behavior/foraging	oral/sugar water
0	lab	imidiclopid	behavior/arching and wing block	oral.guttation fluid
1954	lab	imidiclopid	behavior/PER	oral/sugar water
758	lab	imidiclopid	mortality	oral/food
1118	lab	imidiclopid	ethyl oleate production	oral/sugar water
7391	lab	imidiclopid	sub-lethal/disease status	oral/sugar water
1085	field	thiamethoxam	mortality	dust/corn
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
505	lab	imidiclopid	behavior/homing	oral/sugar water
1954	lab	metabolite of im.	behavior/PER	oral/sugar water
690	field	imidiclopid	colony parameters/collapse	maize flower foraging
2159	lab	imidiclopid	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	imidiclopid	morphology/apoptosis nerve cells	oral
758	lab	imidiclopid	mortality	oral/food
920	field	imidiclopid	colony parameter/survival	contact/foraging
1277	field	imidiclopid	colony parameter/collapse	contact foraging maize
486	desk	clothianidin	mortality	contact/dust/corn
486	desk	anidin and thiametf	mortality	contact/dust/corn
1180	cage	clothianidin	mortality	field exp./potato

7346	lab	thiamethoxam	Enzymes/AChE activity	contact/acetone sol.
1186	greenhouse	clothianidin	mortality	contact
895	field	combination of all	colony parameters	contact/foraging
1264	field	imidiclopid	colony parameters	contact/foraging



0.1 (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	<b>THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY REP</b>
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 foraging 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 µM) 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 significantly
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
insecticide/20L of water	positive	65% mortality with brief dusting
10ml/hl - 12 ± 0.5 hl/h	positive	sharp decline in foraging followed by partial improvement
21ng/bee	positive	suppressed 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	significantly different than control. Most removed by nurse bees
24 ng/larava	positive	pupation rates significantly affected
24 ppb	positive	no difference in foraging 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
30L, 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	neurotoxicity 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 µg/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 µg/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 >1200µg/l, all bees showed abnormal foraging behaviour.
50ppb	positive	flight impaired
50ppb	positive	olfactory 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 verapar	borderline	significantly higher mortality
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	100% mortality at 150 hours
5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml;	positive	especially high mortality in bees with virus
5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml;	positive	highest mortality in younger bees
5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml;	positive	90% mortality
5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml;	positive	younger bees regurgitated but were damaged
5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml;	negative	In Malpighian tubules treated with insecticide a smaller basophilic was observed
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
1/150 mL per 50,000 s	negative	study reported that there were other plants in the area that are favored over the
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 synergistic
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	imidiclopid	behavior/distance travelled	oral/sugar water
859	lab	imidiclopid	mortality	contact/topical
935	lab	imidiclopid	mortality	oral/sugar water
1419	lab	imidiclopid	electrophysiology	direct to antennae
1708	cage	imidiclopid	behavior/learning	oral/sugar water
1888	lab	imidiclopid	effects of long term exposure	oral/sugar water
2183	field	imidiclopid	colony parameter/pollen carrying	field exposure
7303	semi-field	clothianidin	mortality	talc/contact
7556	semi-field	imidiclopid	mortality	contact/leaves alfalfa
818	field	imidiclopid	colony parameters/collapse	l supplemental for overwir
143	cage	imidiclopid	behavior/foraging	field exposure/apple
165	lab	imidiclopid	mortality	all routes
521	lab	imidiclopid	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
601	cage	clothianidin	mortality	oral/sugar water
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water
612	lab	imidiclopid	electrophysiology	oral/pollen/sugar water
616	lab	imidiclopid	behavior/avoidance	contact/oral/dust
622	lab	imidiclopid	behavior/reflex	oral/sugar water
622	lab	mix - imidiclopid	behavior/reflex	oral/sugar water
689	field	clothianidin	colony parameters	field exposure
690	field	clothianidin	colony parameters/collapse	maize flower foraging
690	field	imidiclopid	colony parameters/collapse	maize flower foraging
744	lab	imidiclopid	feeding rate	oral/sugar water
744	lab	imidiclopid	survival/longevity	oral/sugar water
750	semi-field	clothianidin	colony parameter/thermoregulation	contact
750	semi-field	clothianidin	colony parameter/behavior	contact
758	lab	imidiclopid	mortality	oral/food
783	lab	imidiclopid	genetic change/larval gene expression	oral formula
895	field	combination of all	colony parameters	contact/foraging
978	field	clothianidin	mortality	contact/foraging
984	lab	imidiclopid	behavior/reflex	oral/sugar water
1074	cage	imidiclopid	mortality	oral/pollen
1118	lab	imidiclopid	ethyl oleate production	oral/sugar water
1133	lab	imidiclopid	immunity/Total haemolymph count	oral/sugar water
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1264	field	imidiclopid	colony parameters	contact/foraging
1277	field	imidiclopid	colony parameter/collapse	contact foraging maize
1312	field	imidiclopid	mortality	oral/sugar water
1312	field	imidiclopid	colony parameter	oral/sugar water
1312	field	imidiclopid	mortality	oral/sugar water

1312	field	imidiclopid	colony parameter	oral/sugar water
1312	field	imidiclopid	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	imidiclopid	behavior/foraging	oral/sugar water
1400	lab	imidiclopid	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
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard
1708	cage	imidiclopid	mortality	oral/sugar water
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	clothianidin	mortality	contact corn tassels
1760	field	imidiclopid	behavior/activity	oral/food
1760	field	imidiclopid	mortality	oral/food
1760	field	imidiclopid	colony parameter/weight gain	oral/food
1803	field	imidiclopid	behavior/number foraging	ora/sugar water
1923	semi-field	imidiclopid	mortality	contact and oral
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1924	field	imidiclopid	colony parameters	sunflower/field
1934	field	imidiclopid	ly 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	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	sublethal/food intake	oral/sugar water
1954	lab	metabolite of im.	behavior/PER	oral/sugar water

2139	semi-field	imidiclopid	behavior/foraging	oral/food/honey
2139	semi-field	imidiclopid	honey production	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/weight gain	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/offspring	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/brood dev.	oral/food/honey
2139	semi-field	imidiclopid	mortality	oral/food/honey
2183	field	imidiclopid	colony parameters/weight gain	field exposure
2183	field	imidiclopid	colony parameter/number returning be	field exposure
2183	field	imidiclopid	colony parameters/pollen carrying	field exposure
2183	field	imidiclopid	colony parameters/visits to flowers	field exposure
2183	field	imidiclopid	pollination/fruit set	field exposure
2183	field	imidiclopid	colony parameter/colony weight	field exposure
2183	field	imidiclopid	colony parameter/colony growth	field exposure
2183	field	imidiclopid	colony parameter/brood nest size	field exposure
2183	field	imidiclopid	colony parameter/comb size	field exposure
2183	field	imidiclopid	colony parameter/number returning be	field exposure
7467	field	imidiclopid	behavior/foraging	contact/brassica
7467	field	imidiclopid	behavior/foraging	contact/brassica
7467	field	imidiclopid	behavior/foraging	contact/brassica
7533	tent		colony parameters/varied	field exposure
0	lab	clothianidin	behavior/arching and wing block	oral.guttation fluid
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid
0	lab	imidiclopid	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
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	avoidance/food intake	oral/sugar water
143	cage	imidiclopid	behavior/foraging	field exposure/dandelion
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
319	cage	imidiclopid	mortality	contact/alfalfa
326	cage	imidiclopid	mortality	contact/alfalfa
397	lab	imidiclopid	binding to acetylcholine receptor	
486	desk	clothianidin	mortality	contact/dust/corn
486	desk	imidiclopid and thiamet	mortality	contact/dust/corn
500	lab	thiamethoxam	organ damage	oral/syrup
504	lab	imidiclopid	mortality	oral/sugar water

504	lab	imidiclopid	molecular response/gene expression	oral/sugar water
505	lab	imidiclopid	behavior/homing	oral/sugar water
505	lab	clothianidin	behavior/homing	oral/sugar water
529	lab	imidiclopid	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	imidiclopid	behavior/coordination	oral
535	lab	imidiclopid	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	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water
557	lab	imidiclopid	immunity/deformed wing virus	oral/sugar water
580	lab	imidiclopid	behavior/learning	oral/honey
601	cage	imidiclopid	enzymes/aChE activity	oral/sugar water
601	cage	imidiclopid	mortality/hyperactivity	oral/sugar water
601	cage	clothianidin	enzymes/aChE activity	oral/sugar water
603	lab	imidiclopid	brain morphology	oral/sugar water
612	lab	imidiclopid	biology/Development of hypopharyngea	oral/pollen/sugar water
635	lab	imidiclopid	mortality	oral/sugar water
635	lab	mix - imidiclopid	mortality	oral/sugar water
635	lab	imidiclopid	behavior/reflex	oral/sugar water
635	lab	mix - imidiclopid	behavio/reflex	oral/sugar water
654	lab	imidiclopid	acetylcholinesterase activity/brain	not stated
654	lab	imidiclopid	acetylcholinesterase activity/brain	not stated
662	field	clothianidin	mortality	contact/dust
662	field	imidiclopid	mortality	contact/dust
662	field	thiamethoxam	mortality	contact/dust
680	field	thiamethoxam	behavior/flower visits	field foraging
697	lab	imidiclopid	mortality	film method
697	lab	imidiclopid	mortality	film method
697	lab	imidiclopid	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	imidiclopid	capped brood rate	into laraval combs
753	lab	imidiclopid	pupation rate	into laraval combs

753	lab	imidiclopid	eclosion rate	into laraval combs
753	lab	imidiclopid	behavior/probosis extenion/PER	into laraval combs
758	lab	imidiclopid	mortality	oral/food
788	lab	thiamethoxam	sublethal/biomarkers	contact
818	field	imidiclopid	colony parameters/collapse	I supplemental for overwir
818	field	imidiclopid	colony parameters/collapse	I supplemental for overwir
818	field	imidiclopid	colony parameters/collapse	I supplemental for overwir
818	field	imidiclopid	colony parameters/collapse	I supplemental for overwir
820	lab	imidiclopid	behavior/interaction	oral/sugar water
820	lab	imidiclopid	behavior/time in food zone	oral/sugar water
823	lab	imidiclopid	behavior/foraging and waggle dance	oral
823	lab	imidiclopid	behavior/PEReflex	oral
833	field	thiamethoxam	behavior/homing rate	oral/sugar water
863	field	imidiclopid	colony parameter	oral supplements
865	field	clothianidin	mortality	contact/dust
865	field	imidiclopid	mortality	contact/dust
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/homing	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	clothianidin	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/homing rates	oral/sugar water
868	field	imidiclopid	behavior/homing	oral/sugar water
868	field	imidiclopid	behavior/foraging rate	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging/trip duration	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/feeding	oral/sugar water
884	semi-field	clothianidin	mortality	contact
915	field	imidiclopid	behavior/flower visits	contact/foraging
920	field	imidiclopid	colony parameter/survival	contact/foraging
978	field	clothianidin	mortality	contact/foraging
984	lab	imidiclopid	behavior/reflex/PER	oral/sugar water
1005	lab	imidiclopid	development/cell death	oral/larval food
1011	semi-field	clothianidin	mortality	contact/oral/dust
1011	semi-field	clothianidin	behavior	contact/oral/dust
1023	lab	imidiclopid	morphology/acini diameter	oral/sugar water
1074	cage	imidiclopid	chronic food consu.	oral/pollen
1075	lab	imidiclopid	behavior/navigation	oral/pollen
1075	lab	imidiclopid	behavior/PEReflex	oral/pollen
1076	field	imidiclopid	colony parameter/collapse	unknown origin
1085	field	thiamethoxam	mortality	dust/corn
1085	field	thiamethoxam	behavior/foraging	contact with corn dust
1107	lab	imidiclopid	genetic/change	oral/sugar water
1133	lab	imidiclopid	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/neurotoxicity	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	spray
1306	lab	thiamethoxam	mortality	contaminated diet
1306	lab	thiamethoxam	mortality	contact/contaminated surface
1306	lab	thiamethoxam	mortality	contact/leaves
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
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1472	lab	thiamethoxam	mortality	contact/citrus leaves
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
1708	cage	imidicloprid	food intake	oral/sugar water
1708	cage	imidicloprid	behavior/foraging	oral/sugar water
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
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	histochemistry	oral/sugar water
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
1921	lab	imidicloprid	sublethal/activities	oral/sugar water
1922	field	imidicloprid	behavior/foraging	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	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	sublethal/food intake	oral/sugar water
1954	lab	imidiclopid	behavior/PER	oral/sugar water
1954	lab	imidiclopid	behavior/PER	oral/sugar water
1954	lab	imidiclopid	behavior/PER	oral/sugar water
1970	lab	imidiclopid	mortality	oral/solution
1970	lab	imidiclopid	mortality	oral/solution
1970	lab	imidiclopid	mortality	oral/solution
2060	lab	imidiclopid	behavior/gustatory threshold	contact/topical
2060	lab	imidiclopid	behavior/locomotion	contact/topical
2060	lab	imidiclopid	behavior/PER	contact/topical
2060	lab	imidiclopid	histochemistry	cranial injection
2095	lab	imidiclopid	behavior/PER	oral/sugar water
2096	lab	imidiclopid	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
2112	lab	imidiclopid	behavior/PER	contact/topical
2157	field	imidiclopid	behavior/orientation/foraging	oral/sugar water
2157	field	imidiclopid	behavior/orientation/foraging	oral/sugar water
2159	lab	imidiclopid	mortality	oral/diet
2159	lab	imidiclopid	behavior/PER	oral/diet
2159	cage	imidiclopid	behavior/flight	oral/sugar water
2159	cage	imidiclopid	behavior/learning	oral/sugar water
2160	lab	imidiclopid	mortality	oral/sugar water
2160	lab	imidiclopid	mortality	oral/sugar water
2162	Tunnel	imidiclopid	ony parameters/visits to feeding static	oral/sugar water
2162	Tunnel	imidiclopid	colony parameters/food intake	oral/sugar water
2162	Tunnel	imidiclopid	colony parameters/feeding duration	oral/sugar water
2207	lab	imidiclopid	/Densitometric analysis for AL and mu	direct to brain
7242	lab	thiamethoxam	mortality	oral/sugar water
7260	lab	imidiclopid	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	colony parameter/strength	talco/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	imidiclopid	mortality	oral/sugar water

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

50-500 ppb	borderline	difference not considered significant
0.005-0.03 µg/bee	borderline	imidiclopid 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
.03-.25ng/bee	negative	abstract says positive for other markers
.03-.25ng/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
0L, 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 th
/150 mL per 50,000 si	negative	study reported that there were other plants in the area that are favored over th
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%
7 µg/kg	negative	not significant
0.7-70 µg/l	negative	not significant
ix10-6-1.5x10-3 m/ml;	negative	In Malpighian tubules treated with insecticide a smaller basophilic was observe
varied	negative	not significant
dust	negative	"However, additional studies are needed to better understand possible synergi
3.55 ng a.i./L	negative	neurotoxicity 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
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	<b>THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY REP</b>
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	
0.002-0.02 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	
0.3-0.8 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./m <sup>2</sup>	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
.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
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
.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
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
µ 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

2000 ng/larava	positive	eclosion rates significantly affected from 2000 up
0.04 ng/larava	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/l	positive	4 of 4 colonies collapsed starting at 16 weeks
3 (4wk)/ 200 (9wk) µg/l	positive	All colonies failed
5 (4wk)/ 400 (9wk) µg/l	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 foraging 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
1x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	especially high mortality in bees with virus
1x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	highest mortality in younger bees
1x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	90% mortality

$5 \times 10^{-6}$ - $1.5 \times 10^{-3}$ 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 $\mu$ g/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
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 - $12 \pm 0.5$ hl/h.	positive	foraging behavior significantly impaired
30ml/hl - $12 \pm 0.5$ hl/h.	positive	sharp decline in foraging followed by partial improvement
0.2 g/litre	positive	number of returning bees greatly affected
48 $\mu$ g/kg	positive	lower food intake in treated group
48 $\mu$ g/kg	positive	significantly less foraging behavior in treated group
0.5-5.0 $\mu$ g/lin syrup	positive	significant increase in pollen carrying
0.5-5.0 $\mu$ g/lin syrup	positive	significant difference in capped brood
6 $\mu$ g/kg	positive	significant difference in activity that was dose and time dependent
1.00.1-10.0 $\mu$ g/L	positive	significant mortality in all groups
1.00.1-10.0 $\mu$ g/L	positive	mortality at all levels
24 $\mu$ g/kg	positive	PER significantly affected
24 $\mu$ g/kg	positive	foraging behavior significantly impaired
20-50 $\mu$ g/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 foraging impairment at higher dosages
110 $\mu$ M	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	olfactory 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
0.0428-0.428 ng a.i./µl	positive	sublethal doses cause damage to brain and midgut
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	100 % mortality at sublethal doses at 234 hours
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	80% mortality at 92 hours sub lethal
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	high mortality with significant motor coordination decline in those living
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) 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 significantly
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

mortality  
re maize  
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ees after one week of treatment.

to discriminate  
tory memory  
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to discriminate

**ORTED THIAMETHOXAM.**

it not present

e can reverse



regularly treated

tory memory

analysed.

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	imidiclopid	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	imidiclopid	colony parameter	oral/sugar water
1314	lab	thiamethoxam	behavior	contact/topical
689	field	clothianidin	colony parameters	field exposure
1314	lab	thiamethoxam	behavior	oral/sugar water
1314	lab	thiamethoxam	learning	contact/topical
818	field	imidiclopid	colony parameters/collapse	I supplemental for overwir
7302	lab	thiamethoxam	mortality	oral/sugar water
1472	lab	thiamethoxam	mortality	contact/citrus leaves
1472	lab	thiamethoxam	mortality	contact/citrus leaves
545	lab	thiamethoxam	mortality	contact/spray
545	lab	thiamethoxam	mortality	oral/sugar water
545	lab	thiamethoxam	mortality	contact/leaves
1922	field	imidiclopid	behavior/foraging	oral/sugar water
1259	greenhouse	thiamethoxam	mortality	contact/oral/dust
1970	lab	imidiclopid	mortality	oral/solution
7302	lab	thiamethoxam	mortality	oral/sugar water
7260	lab	clothianidin	mortality	contact/film
7260	lab	imidiclopid	mortality	contact/film
1306	lab	thiamethoxam	mortality	contact/leaves
865	field	imidiclopid	mortality	contact/dust
865	field	clothianidin	mortality	contact/dust
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
2160	lab	imidiclopid	mortality	oral/sugar water
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	mortality	contact/alfalfa
143	cage	imidiclopid	mortality	contact/alfalfa
662	field	clothianidin	mortality	contact/dust
1265	lab	imidiclopid	mortality	all routes
1265	lab	imidiclopid	mortality	all routes
1074	cage	imidiclopid	mortality	oral/pollen
1265	lab	imidiclopid	mortality	all routes
818	field	imidiclopid	colony parameters/collapse	I supplemental for overwir
326	cage	imidiclopid	mortality	contact/alfalfa
818	field	imidiclopid	colony parameters/collapse	I supplemental for overwir
1265	lab	imidiclopid	mortality	all routes
1213	lab	imidiclopid	mortality	contact/filter paper
978	field	clothianidin	mortality	contact/foraging
1306	lab	thiamethoxam	mortality	contact/contaminated surfa
165	lab	imidiclopid	mortality	all routes
143	cage	imidiclopid	behavior/foraging	field exposure/dandelion

1265	lab	imidiclopid	mortality	all routes
680	field	thiamethoxam	behavior/flower visits	field foraging
165	lab	imidiclopid	mortality	all routes
1644	field	imidiclopid	mortality	contact/foraging
1265	lab	imidiclopid	mortality	all routes
504	lab	imidiclopid	mortality	oral/sugar water
1970	lab	imidiclopid	mortality	oral/solution
1306	lab	thiamethoxam	mortality	spray
1265	lab	imidiclopid	mortality	all routes
868	field	imidiclopid	behavior/homing rates	oral/sugar water
7302	lab	thiamethoxam	mortality	oral/sugar water
143	cage	imidiclopid	avoidance/food intake	oral/sugar water
1265	lab	imidiclopid	mortality	all routes
662	field	thiamethoxam	mortality	contact/dust
165	lab	imidiclopid	mortality	all routes
1146	lab	thiamethoxam	mortality	oral/honey insecticide
1970	lab	imidiclopid	mortality	oral/solution
143	cage	imidiclopid	mortality	contact/alfalfa
1306	lab	thiamethoxam	mortality	contaminated diet
1845	lab	imidiclopid	histochemistry	oral/sugar water
601	cage	clothianidin	mortality	oral/sugar water
7346	lab	thiamethoxam	Enzymes/AChE activity	contact/acetone sol.
601	cage	imidiclopid	enzymes/aChE activity	oral/sugar water
601	cage	clothianidin	enzymes/aChE activity	oral/sugar water
1023	lab	imidiclopid	morphology/acini diameter	oral/sugar water
1164	field	imidiclopid	behavior/activity	contact/foraging
1164	field	thiamethoxam	behavior/activity	contact/foraging
504	lab	imidiclopid	molecular response/gene expression	oral/sugar water
557	lab	clothianidin	immunity/immune response	contact/topical
818	field	imidiclopid	colony parameters/collapse	I supplemental for overwir
818	field	imidiclopid	colony parameters/collapse	I supplemental for overwir
603	lab	imidiclopid	brain morphology	oral/sugar water
529	lab	imidiclopid	morphology/apoptosis nerve cells	oral
868	field	imidiclopid	behavior/homing	oral/sugar water
1358	field	imidiclopid	behavior/foraging	oral/sugar water
1186	greenhouse	clothianidin	mortality	contact
2139	semi-field	imidiclopid	behavior/foraging	oral/food/honey
1408	lab	thiamethoxam	behavior/locomotion	oral/sugar water
1408	lab	thiamethoxam	behavior/PEReflex	contact/topical
1400	lab	imidiclopid	behavior/foraging	oral/sugar water
788	lab	thiamethoxam	sublethal/biomarkers	contact
1076	field	imidiclopid	colony parameter/collapse	unknown origin
750	semi-field	clothianidin	colony parameter/strength	contact
7303	semi-field	clothianidin	mortality	talco/contact
1074	cage	imidiclopid	chronic food consu.	oral/pollen
533	lab	thiamethoxam	behavior/foraging	oral
2162	Tunnel	imidiclopid	colony parameters/food intake	oral/sugar water
1153	lab	imidiclopid	mortality/neurotoxicity	oral/food
820	lab	imidiclopid	behavior/distance travelled	oral/sugar water
1690	field	thiamethoxam	Behavior/returning bees	contact/foraging mustard

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

868	field	imidiclopid	behavior/foraging	oral/sugar water
580	lab	imidiclopid	behavior/learning	oral/honey
1708	cage	imidiclopid	behavior/learning	oral/sugar water
820	lab	imidiclopid	behavior/time in food zone	oral/sugar water
505	lab	clothianidin	behavior/homing	oral/sugar water
534	lab	imidiclopid	behavior/coordination	oral
165	lab	imidiclopid	mortality	all routes
820	lab	imidiclopid	behavior/interaction	oral/sugar water
1708	cage	imidiclopid	food intake	oral/sugar water
0	lab	thiamethoxam	behavior/arching and wing block	oral.guttation fluid
697	lab	imidiclopid	mortality	film method
697	lab	imidiclopid	mortality	film method
697	lab	imidiclopid	mortality	film method
1802	lab	mix imidiclopid	mortality	oral/sugar water
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
165	lab	imidiclopid	mortality	all routes
1400	lab	imidiclopid	mortality	oral/sugar water
7391	lab	imidiclopid	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	imidiclopid	behavior/foraging	oral/sugar water
635	lab	imidiclopid	mortality	oral/sugar water
635	lab	mix - imidiclopid	mortality	oral/sugar water
884	semi-field	clothianidin	mortality	contact
1085	field	thiamethoxam	mortality	dust/corn
1171	field	clothianidin	mortality	contact/foraging
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
2159	lab	imidiclopid	mortality	oral/diet
2096	lab	imidiclopid	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
7242	lab	thiamethoxam	mortality	oral/sugar water
1075	lab	imidiclopid	behavior/navigation	oral/pollen
1312	field	imidiclopid	mortality	oral/sugar water
750	semi-field	clothianidin	colony parameter/thermoregulation	contact
744	lab	imidiclopid	feeding rate	oral/sugar water

744	lab	imidiclopid	survival/longevity	oral/sugar water
823	lab	imidiclopid	behavior/foraging and waggle dance	oral
1923	semi-field	imidiclopid	mortality	contact and oral
750	semi-field	clothianidin	colony parameter/behavior	contact
143	cage	imidiclopid	behavior/foraging	field exposure/apple
601	cage	clothianidin	mortality/hyperactivity	oral/sugar water
1708	cage	imidiclopid	mortality	oral/sugar water
521	lab	imidiclopid	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	imidiclopid	electrophysiology	oral/pollen/sugar water
616	lab	imidiclopid	behavior/avoidance	contact/oral/dust
622	lab	imidiclopid	behavior/reflex	oral/sugar water
622	lab	mix - imidiclopid	behavior/reflex	oral/sugar water
984	lab	imidiclopid	behavior/reflex	oral/sugar water
1075	lab	imidiclopid	behavior/PEReflex	oral/pollen
1118	lab	imidiclopid	ethyl oleate production	oral/sugar water
1133	lab	imidiclopid	immunity/Total haemolymph count	oral/sugar water
1264	field	imidiclopid	colony parameters	contact/foraging
1532	field	clothianidin	colony parameter/weight	contact/foraging canola
1532	field	clothianidin	honey production	contact/foraging canola
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	imidiclopid	mortality	contact corn tassels
1709	lab	clothianidin	mortality	contact corn tassels
1760	field	imidiclopid	behavior/activity	oral/food
1760	field	imidiclopid	mortality	oral/food
1760	field	imidiclopid	colony parameter/weight gain	oral/food
1803	field	imidiclopid	behavior/number foraging	ora/sugar water
1934	field	imidiclopid	ry parameters/summer dev/winter su	oral/sugar water
1949	lab	metabolite of im.	behavior/PER	oral/sugar water
1954	lab	imidiclopid	mortality	oral/sugar water
1954	lab	imidiclopid	sublethal/food intake	oral/sugar water
1954	lab	metabolite of im.	behavior/PER	oral/sugar water
2183	field	imidiclopid	colony parameters/weight gain	field exposure
2183	field	imidiclopid	olony parameter/number returning be	field exposure
2183	field	imidiclopid	colony parameters/pollen carrying	field exposure
2183	field	imidiclopid	colony parameters/visits to flowers	field exposure
2183	field	imidiclopid	pollination/fruit set	field exposure
2183	field	imidiclopid	colony parameter/colony weight	field exposure
2183	field	imidiclopid	colony parameter/colony growth	field exposure
2183	field	imidiclopid	colony parameter/brood nest size	field exposure

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

1954	lab	imidiclopid	sublethal/food intake	oral/sugar water
783	lab	imidiclopid	genetic change/larval gene expression	oral formula
1888	lab	imidiclopid	effects of long term exposure	oral/sugar water
2183	field	imidiclopid	colony parameter/pollen carrying	field exposure
397	lab	imidiclopid	binding to acetylcholine receptor	
1312	field	imidiclopid	mortality	oral/sugar water
690	field	clothianidin	colony parameters/collapse	maize flower foraging
690	field	imidiclopid	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	imidiclopid	genetic/change	oral/sugar water
1408	lab	thiamethoxam	behavior/locomotion/learning	oral/topical
868	field	imidiclopid	behavior/feeding	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
7352	field	thiamethoxam	behavior/returning bees	oral/sugar water
2160	lab	imidiclopid	mortality	oral/sugar water
868	field	imidiclopid	behavior/foraging	oral/sugar water
505	lab	imidiclopid	behavior/homing	oral/sugar water
7556	semi-field	imidiclopid	mortality	contact/leaves alfalfa
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	contact/topical
557	lab	imidiclopid	immunity/deformed wing virus	contact/topical
557	lab	clothianidin	immunity/deformed wing virus	oral/sugar water
557	lab	imidiclopid	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	imidiclopid	behavior/arching and wing block	oral.guttation fluid
1146	lab	thiamethoxam	mortality	oral/honey insecticide
662	field	imidiclopid	mortality	contact/dust
1312	field	imidiclopid	mortality	oral/sugar water
1312	field	imidiclopid	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	imidiclopid	honey production	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/weight gain	oral/food/honey
2139	semi-field	imidiclopid	colony parameter/offspring	oral/food/honey

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

0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile in an olfactory
0.1-1 ng/bee	negative	"0.01 ng/bee, honeybees spent significantly more time immobile in an olfactory
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 honeybees
0.1-1 ng/bee	negative	"Fipronil, used at the dose of 0.1 ng/bee, induced mortality of all honeybees
dust	negative	"However, additional studies are needed to better understand possible synergistic
varied	negative	"However, the risk exposure of bee colonies on adverse impact of pesticides
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 several
0.1-1 ng/bee	negative	"Responsiveness to antennal sucrose stimulation was significantly decreased
30L, 5000x diluted -at 2	negative	"The results indicated that clothianidin spraying of the rice field increased the number
0.1-1 ng/bee	negative	"Thiamethoxam by contact induced either a significant decrease of olfactory
0.1-1 ng/bee	positive	"Thiamethoxam by contact induced either a significant decrease of olfactory
0 µg/kg	control	1 of 4 colonies collapsed at 23 weeks
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) 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/cm <sup>2</sup>	positive	100% mortality after 1 hour
0.00583 ml/cm <sup>2</sup>	positive	100% mortality after 1.51 hours
0.00583 ml/cm <sup>2</sup>	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 <sup>-9</sup> -5x10 <sup>-7</sup> ) 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 H <sub>2</sub> O	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	positive	100% mortality over two seasons
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/l	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 H <sub>2</sub> O	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
insecticide/20L of water	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 <sup>-9</sup> -5x10 <sup>-7</sup> ) 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
1x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml	positive	90% mortality
0.0005-0.05 %	positive	90% mortality at .05%
.028-.28kg a.i./ha	positive	97% mortality with 2 hours aged residue
150 g/100L H2O	positive	99% mortality at 24 hours
0.12-12 ng/bee	positive	A significant increase of CO staining
.03-.25ng/bee	negative	abstract says positive for other markers
not stated	positive	acetylcholinesterase and carboxylesterase significantly decreased
.03-.25ng/bee	positive	AchE activity much higher
0.12-0.24 ng/bee	positive	AchE activity much higher
1 ppb	positive	acini declined by dose
0.004-0.008 % a.i.	positive	Activity less with exposure
0.004-0.008 % a.i.	positive	Activity less with exposure
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 >1200µg/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

5-20 ppb	positive	difficulty when exposed to other toxins as compared to controls
7 µg/kg	positive	disease progressed more rapidly in treated group
23.3 mg/L	positive	dose dependent
3-100 µg/kg	positive	duration of feeding declined
0.5-2 ng/bee	positive	duration of trips significantly affected
0.5-2 ng/bee	positive	duration of trips significantly affected
2000 ng/larava	positive	eclosion rates significantly affected from 2000 up
100-500 ppb	positive	effects within 1 hour vanished after 30 hours
5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml;	positive	especially high mortality in bees with virus
0.5-2 ng/bee	positive	feeder visits reduced significantly
24-241 ppb	positive	Fewer PER responses that were further reduced by dose increase
5.12 ug/m2	positive	flight activity higher in treated group
50ppb	positive	flight impaired
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%
7.35 g a.i./ha50%	positive	foraging behavior significantly impaired
30ml/hl - 12 ± 0.5 hl/h;	positive	foraging behavior significantly impaired
24 µg/kg	positive	foraging behavior significantly impaired
96ppb	positive	Formula was adjusted by Abbot
68ppb	negative	Formula was adjusted by Abbott and then retested providing stated results
51.2 ug/m2	positive	high mortality and colony strength decline
field exposure	positive	High mortality reported in 2012
field exposure	positive	High mortality reported in 2012
(5x10 <sup>-9</sup> -5x10 <sup>-7</sup> ) ng a	positive	high mortality with significant motor coordination decline in those living
400 ppm	positive	high rate of apoptosis
dust	positive	higher mortality, higher queen mortality and lower hive weight
0.7-70 µg/l	positive	highest mortality at 11 days
0.7-70 µg/l	positive	Highest mortality in bees infected with Nosema
5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml;	positive	highest mortality in younger bees
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 mg/seed	negative	hives were placed in field when flowers bloomed not when planted so seed dus
0.24-0.30 ng/bee	positive	hyperactivity - tremors - higher mortality
20-50 µg/kg	positive	hyperactivity - tremors - higher mortality
2.1 (sugar water)	positive	hypopharyngeal glands significantly smaller
0.7-70 µg/l	positive	Imidacloprid had a greater effect as the acorns were much more atrophied
0.005-0.03 µg/bee	borderline	imidicloprid toxicity not affected by diet
1/5 of LD50	positive	impaired sucrose metabolism
5x10 <sup>-6</sup> -1.5x10 <sup>-3</sup> m/ml;	negative	In Malpighian tubules treated with insecticide a smaller basophilic was observe
10 <sup>-8</sup> -10 <sup>-4</sup> M	positive	increased cytochrome oxidase (CO) labelling within 30 min in all the structures
.168kg a.i./ha	positive	increased from 14% to 19% in 2 hours
295 nM	positive	inhibited AChE response
200 nM	positive	inhibited AChE response
0.15-6ng/bee	positive	intervals between feedings increased by 33% up to 993% respectively

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	neurotoxicity 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 foraging but significant difference in dance
0.6-14 g a.i./ha	negative	no effect
5.12 ug/m <sup>2</sup>	negative	no significant change
0.112 kg(a.i.)/ ha	negative	no significant difference
.03-.25ng/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./m <sup>2</sup>	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 significantly
50ppb	positive	olfactory 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 (IC <sub>50</sub> ) 1-9 µM) 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
!0ml/hl - 12 ± 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
6 µg/kg	positive	significant difference in activity that was dose and time dependent
0.5-5.0 µg/lin syrup	positive	significant difference in capped brood
0.6-14 g a.i./ha	positive	significant foraging 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/bee	positive	significant impairment of PER function
10.1-10ng/bee	positive	significant impairment of PER function
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
1.25ng/bee	positive	significant impairment of PER function
1.25-20 ng/bee	positive	significant impairment of PER function
0.1-10 ng/bee	positive	significant impairment of PER function
4-40ppb	positive	significant impairment of PER function
1.25-5 ng/bee	positive	significant increase in immobility and loss of coordination
0.5-5.0 µg/lin syrup	positive	significant increase in pollen carrying
5 ng/bee	positive	significant loss of sensitivity
1.00.1-10.0 µg/L	positive	significant mortality in all groups
0.04 ng/larva	positive	significant olfactory impairment dose dependent
1.34 ng/bee	positive	significant reduction in homing up to 31% failed to return to hive 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/bee	positive	significant staining observed
50 ng/µl 1mM verapar	borderline	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 the
150 mL per 50,000 sq	negative	study reported that there were other plants in the area that are favored over the
0.0428-0.428 ng a.i./µl	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. Damage
21ng/bee	positive	suppressed 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	<b>THIS STUDY TESTED BOTH IMIDICLOPRID AND THIAMEXOXAM BUT ONLY REP</b>
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 <sup>-6</sup> -1.5x10 <sup>-3</sup> 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
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0.002-0.02 mg/kg	negative

open-field apparatus and ingested significantly more water  
open-field apparatus and ingested significantly more water  
bees earlier exposed to dust in the field."

bees after one week of treatment.

bees after one week of treatment.

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

ability to discriminate between a known and an unknown odorant.

ability to discriminate between a known and an unknown odorant.

in several hives a couple of weeks after treatment,

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

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

short-term memory 24 h after learning at 0.1 ng/bee or a significant impairment of learning performance with no effect on r

short-term memory 24 h after learning at 0.1 ng/bee or a significant impairment of learning performance with no effect on r



is not present

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analysed.





regularly treated

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e can reverse

**ORTED THIAMETHOXAM.**



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

memory at 1 ng/bee

memory at 1 ng/bee