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Seed Corn providers in Vermont

Treated/untreated Corn

Distributor	Treated	Untreated
Bayer Crop Science	41,240	
Channel Bio	36,560	
FBN Inputs, LLC	1036	
Kent Nutrition Group, Inc	214	4
Loveland Products, Inc.	39,400	
Mycogen Seeds c/ Dow AgroSciences LLC	1,497,900	900
Pioneer Hi-Bred International, Inc.	576,315	
Seedway LLC	278,500	900
Syngenta Seeds, LLC	229,700	
Winfield Solutions LLC	89,150	
Pounds	2,790,015	1804
Tons	1395.008	0.902

Plant Incorporated Protection- Corn

Distributor	Pounds	Trait Packages
Kent Nutrition Group, Inc	2,450	HT, HT/IR
L.D. Oliver Seed Company Inc.	24,525	HT/IR
Loveland Products, Inc.	31,750	HT, HT/IR
Mycogen Seeds c/o Dow AgroSciences LLC	569,350	HT, HT/IR
Pioneer Hi-Bred International, Inc.	32,800	HT, HT/IR
Seedway LLC	519,200	HT, HT/IR
Syngenta Seeds	141,500	HT, HT/IR
Winfield Solutions, LLC	89150	HT, HT/IR
Pounds	1,410,725	
Tons	705.3625	

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Seed genetic traits for insect management

- Many corn seed varieties include Plant Incorporated Protectants (PIP)
- These are primarily genes that produce B.t. toxins in leaves
- These protect against above ground corn pests – primarily Lepidoptera
- Use of these varieties reduces or eliminates the need for foliar application of pesticides
- These varieties are reported to not be available without insecticide coatings

Without PIPs and without insecticide seed treatments:

- Soil applied pesticides would be applied in-furrow
- Foliarly applied pesticides would be applied

Possible result would be an increase in pesticide use

List of genetic traits available:
\https://www.texasinsects.org/bt-corn-trait-table.html

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Corn insect management without PIPs

Foliar pesticides

Armyworms

Threshold: Whorled-sized plants—most plants show damage, 3 larvae/plant

Insecticide	Pounds Active Ingredient/A	Amount of Formulated Product
§ Lambda-cyhalotrin (*Warrior II)	0.02-0.03 (See label)	1.28—1.92 fl. oz./acre
chlorpyrifos (*Lorsban 4E)	0.5—1.0	1—2 pt./A
Min. days to harvest-21. Foliar application. Consult the label.		
§ Permethrin (*Pounce, *Ambush)	0.1—0.2	see label
Apply before brown silk formation. Consult the label.		

Cutworms

Threshold: 5% or more of plants cut. See text.

Insecticide	Pounds Active Ingredient/A	Amount of Formulated Product
chlorpyrifos (*Lorsban 4E)	0.5—1.0	1—2 pt./A
Min. days to harvest-21. Foliar application. Consult the label.		
§ Permethrin (*Pounce, *Ambush)	0.1—0.2	see label
Apply before brown silk stage. Consult the label.		
§ Lambda-cyhalotrin (*Warrior II)	0.015—0.025	0.96—1.6 fl. oz./acre

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Corn insect management without PIPs

Soil applied pesticides

Tefluthrin - .327 lbs AI /acre - Synthetic pyrethroid – Federal RUP

Bifenthrin – 0.1 lbs AI/ acre – Synthetic pyrethroid – State RUP

Broflanilide – 0.0445 lbs AI/Acre – Diamide – State RUP

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Economic impacts

- Elson Shields, Cornell University Research on stand losses due to seed corn maggot (SCM) (AIB 6/26/23 presentation)
- Seed treatment has helped farmers adopt the use of cover crops
  - "It is important to understand that in the absence of these seed protectants, farmers may revert to planting fewer cover crops to avoid losses to SCM"
- 2 year study looking at % stand loss with and without neonic seed treatment (2021-2022)

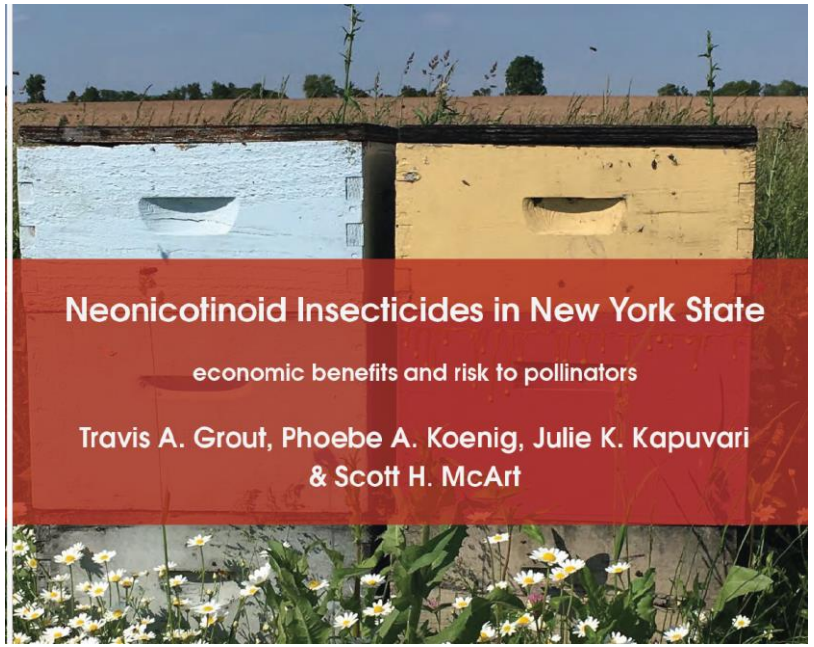
> "Research data collected in controlled studies during 2021 at the Cornell Musgrave Farm located in Aurora, NY shows that in corn production following a cover crop, seed corn maggot economically damaged 54% of the non-insecticide seed treated plots ranging from 11% to 62% stand losses."

Seed Corn Maggot, Stand Losses and the Need for Insecticide Seed Treatments - Elson Shields, Cornell University

Seed Corn Maggot, Stand Losses and the Need for Insecticide Seed Treatments – What's Cropping Up? Blog (cornell.edu)

For farmers focusing on silage production (40% of New York corn acres), the New York data set (n = 10 comparisons) indicates that neonicotinoid-treated seeds were more cost-effective than using fungicide-only seeds, resulting in a mean net income benefit of $61.42 per hectare (3% increase in income per hectare) relative to using fungicide-only seeds (see Table 5.8).

Similar to the yield results in Section 5.2.1, it is important to note that, when significant here and below, differences in mean net income were largely influenced by a small proportion of comparisons. This is because the yield data summarized in Section 5.2.1 are used in the calculation of net income effects and a small proportion of those trials observed significant differences in yield (see Table 5.2 and Figure 5.2). In other words, the data indicate that when there are overall economic benefits of using neonicotinoid-treated seeds, a small proportion of farmers will experience significant economic benefits, while the majority of farmers will not. Unfortunately, because variance was rarely noted in the underlying yield studies, it is not possible to estimate the exact proportion of farmers that are likely to experience significant net income benefits of using neonicotinoid-treated seeds, though the number is probably similar to the proportion of trials experiencing significant yield benefits.



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Vermont Winter Loss Survey Results – Operations with more than 20 colonies (number of colonies in survey)

	<10%	10-20%	20-30%	30-50%	>50%	Average	Median	Total Colonies
2022	10 (3577)	7 (2130)	9 (888)	7 (1055)	10 (1223)	23.41%	24.34%	8873

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NASS Loss Surveys – 2021 - Percent loss reported per survey period (colonies in Vermont included in survey)

State	Winter	Spring	Summer	Fall
Vermont	17 (7,500)	1 (7,000)	<1(7,000)	1 (7,000)
New York	16	6	8	32
National	16	12	9	11

NASS Loss Surveys – 2022 - Percent loss reported per survey period (colonies in Vermont included in survey)

State	Winter	Spring	Summer	Fall
Vermont	5 (7,500)	2 (8,500)	2 (10,000)	4 (10,000)
New York	13	4	7	23
National	12	13	11	12

https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Bee_and_Honey/

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Canada Winter Loss Surveys - Percent Winter Colony Loss Survey

Year	Quebec	Ontario	National
2018	30.7	45.7	32.6
2019	25.0	22.6	25.7
2020	33.8	19.1	30.2
2021	19.0	17.8	23.2
2022	48.4	48.8	45.5
2023	16.3	35.7	32.2

https://capabees.com/