

New England Sweet Corn Pest Management Survey Summary

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The following is a summary of a 46-question survey that was distributed to 754 New England growers in the fall of 2004. Dillman survey methodology was used to design and conduct the survey. Complete survey results and original survey are available at the website www.pronewengland.org.

Preliminary card notice sent	October 20, 2004
Sweet corn surveys sent	November 4, 2004
Reminder cards were sent to 420 growers	November 26, 2004
Second sweet corn surveys were sent to 413 growers	December 9, 2004

New England Sweet Corn Pest Management Survey Returns

State	#Surveys Sent	#Surveys Returned	%Return ¹	#Growing Sweet Corn	#Sweet Corn Acres
MA	261	167	64%	98	2523
ME	130	94	72%	56	801
NH	213	126	59%	28	565
RI	42	26	62%	9	395
VT	23	17	74%	17	169
CT	85	46	54%	6	21
Total	754	476	63%	215	4474

¹Most percents in this document have been rounded for ease of reporting.

Crop Information

Massachusetts led the reported sweet corn acreage in 2004 with 2523 acres. Maine had 801 acres of sweet corn, followed by New Hampshire with 565 acres, Rhode Island with 395 acres, Vermont with 169 acres, and Connecticut with 21 acres.

The majority of growers (73%)² throughout the region reported an average yield of 186 bushels bags per acre (3544 acres). The total yield per year was reported as 660,799 bushel bags.

Fifty-four percent of the acreage was used for **fresh market retail**. **Fresh market wholesale** used 44% of the acreage and **U-pick** and **processing** at less than 1% each.

²Percentages of growers were calculated using the 215 growers who responded to the survey as the denominator, not the number of growers responding to a particular question. Many questions allowed multiple answers, thus percentage responses may sum to more than 100%.

Horticultural Management

The majority of growers (94%) practiced **direct seeding into bare ground** while 22% practiced **direct seeding under plastic** and 21% planted **direct seed under row covers**. Fewer growers used transplants including 7% planted **transplants into bare ground**, 6% planted **transplants with row covers** and 4% planted **transplants in plastic**.

Forty percent of the growers said they use soil tests to determine fertilizer needs **every 2-3 years**. Twenty-nine percent use soil test on an **annual basis** and 20% said that they **did not use** soil tests. Seven percent of growers reported using soil tests every **4-5 years** and 1% said **they do not use fertilizer**.

When growers were asked what nutrient management practices they used, the majority (67%) said they used **grass cover crop** (rye, oat, sudax, etc.), while 40% used **pre-side dress nitrate test (June)**, 30% made **manure applications**, 16% used **compost application or other** means, and 15% use **legume cover crops (clover, vetch, etc.)**

Growers were asked to estimate the average number of pesticide applications made for sweet corn in a typical year. The average number of pesticide applications made for the following pests was: **insects** 4.02, **weeds** 1.15, **diseases** 0.135, and **mites** 0.08.

Insect and Mite Pest Management

Growers ranked the frequency and management of insect pests with **corn earworm, European corn borer, fall armyworm, corn leaf aphid, and common armyworm** reported as the top five insect pests requiring routine annual management.

Growers were asked which practices they used to manage insect and/or mite pests. Eighty-one percent of the growers reported using **field scouting for worms and feeding damage** and 10% **scouted for beneficials**. Thirty-two percent of the growers used **pheromone traps for corn ear worm**, while 25% used **pheromone traps for European corn borer**, and 20% used **pheromone traps for fall armyworm**. The majority of growers (60%) **read state or regional pest alerts**.

Pesticide applications were applied to 81% of the sweet corn acreage to manage **corn earworm**. Growers (48%) used Warrior³ on 60% of the acreage. Lannate SP was used on 48%, followed by Pounce on 46%, Golden Natural Spray Oil on 26%, Entrust on 23% and Permethrin on 20%. The majority of the growers reported “excellent” and “good” control with these products.

Pesticide applications were applied to 77% of the sweet corn acreage to manage **European corn borer**. Growers (44%) used Warrior on 51% of the acreage. Lannate SP was used on 49% of the acreage, followed by Larvin 3.2 on 19%, Ambush on 15%, Asana XL on 13% and Spintor 2SC on 10%. Several other products were applied to less than 9% of the acreage. The majority of growers reported “excellent” or “good” control with these products.

³See Appendix A (page 7) for pesticide brand names and active ingredients

Pesticide applications were applied to 37% of the sweet corn acreage for the control of **fall armyworm**. Growers (34%) used Warrior on 25% of the acreage. Lannate SP was used on 20% of the acreage, followed by Larvin 3.2 on 5%, and Asana XL, Baythroid 2, Ambush, Mustang, on less than 4%. Growers reported “excellent” and “good” control with these products.

Corn leaf aphid was managed on 29% of the sweet corn acreage. Lannate SP was used on 20% of the acreage and Warrior on 13%. The majority of growers reported “excellent” control with these products.

Seedcorn maggot was managed on 28% of the acreage. Seventeen percent of the sweet corn acreage was treated with Gaucho 600, followed by Lorsban 4E on 14% and Sevin XLR Plus on <1%. Growers reported “excellent” control with these products.

Pesticide applications were applied to 12% of the sweet corn acreage to control **stalk borer**. Growers used Warrior on 9% of the acreage, Ambush on 4%, and Baythroid on 2%. Growers reported “excellent” control using these products.

Pesticide applications were applied to 11% of the sweet corn acreage to manage **cutworms**. Growers (3%) used Lorsban 4E on 9% of the acreage. Warrior was used on 2% of the acreage and Sevin XLR Plus on <1%. Growers reported “excellent” control with these products.

Corn flea beetle was managed on 10% of the sweet corn acreage. Lannate SP was used on 8% of the acreage and Warrior, Thimet 20G, Ambush, Gaucho 600, and Cruiser 5FS on 1%. Growers reported that these products provided “excellent” or “good” control.

Pesticide applications were applied to 8% of the sweet corn acreage to manage **sap and picnic beetles**. Growers (4%) used Lannate SP on 4% of the acreage. Baythroid, Warrior, and Asana XL were used on less than 3% of the acreage. The majority of growers reported “excellent” or “good” control with these products.

Wireworms were managed on 4% of the acreage. Three percent of the sweet corn acreage was planted with **treated seed** to manage wireworms. Two percent of the acreage was treated with Cruiser 5FS followed by Gaucho, Counter 15G, Kernal Guard, and Diazinon on 1%. Growers reported “good” control with these products.

Pesticide applications were applied to 2% of the sweet corn acreage to manage **Japanese beetle**. Growers (3%) used Warrior on 2% of the acreage. Growers reported “excellent” control with these products. No other pesticides were reported for control of this pest.

Twospotted spider mite were managed on <1% of the acreage. Less than one percent of the acreage was treated with Capture 2EC for control of the twospotted spider mite.

Disease and Virus Management

Annual management for diseases and viruses was practiced by less than 3% of the growers. Thirty-six percent of the growers reported occasional management for common smut, followed by rust at 33%, seed decay at 26%, Stewart's wilt at 20% and maize dwarf mosaic virus at 11%.

Growers used one or more of the **practices** to control diseases in sweet corn. **Crop rotation** was used by 58% of growers, while **fungicide-treated seed** were used by 56% of growers, and **disease tolerant varieties** were used by 49% of growers. Seven percent of the growers used the **application of fungicides** as a management practice while 2% said they used other control methods.

Pesticide applications were applied to 7% of the sweet corn acreage to manage **rust**. Growers used Dithane, Maneb, and Manzate on 6% of the acreage. The majority of growers reported "good" control with these products.

Weed Management

One hundred and forty-eight growers (69%) reported using **mechanical cultivation** to manage weeds. Growers used other weed management strategies including: **hand pulling** (27%), **hoeing** (20%), **banded herbicide application** (16%), **spot treatment** (14%), and **shielded application** (7%). The majority of growers reported "good" control from these strategies. Other practices reported included broadcast spray, complete field spray and pre-emergence application.

Four percent of the sweet corn acreage received **stale bed application**. Roundup was applied to 3% of the acreage. Growers reported "excellent" control with this product. Other herbicides were applied to less than 1% of the acreage.

Pre-emergence soil applied herbicide applications for annual grass and broadleaf weeds were made on 90% of the sweet corn acreage. Aatrex 4L was applied to 56% of the acreage, followed by Dual Magnum on 47%, Bicep Magnum on 28%, Prowl on 27%, and Lasso 4EC on 25%. Bicep Lite Magnum was applied to 11% of the acreage, Eradicane 6E and Sutan+ 6.7E on 8%, Princep 80WP on 6%, Laddox on 4%, and Frontier 6.0 on 2%. Growers reported "good" control with these products.

Thirty-four percent of the sweet corn acreage received **post-emergence applied** herbicide applications for control of annual grass and broadleaf weeds. Basagran 4E was applied to 23% of the acreage, followed by Aatrex 4L on 21%, Permit 57WDG on 11%, and Amine 4 on 4%. Growers reported "good" control with these products.

Perennial weeds were controlled with herbicide application on 11% of the sweet corn acreage. Roundup was applied to 11% of the sweet corn acreage and reported "excellent" control. Basagran, Laddox, Credit, Permit, Dual Magnum, Aatrex 4L and 2,4-D were applied to <1%.

Vertebrate Pest Management

Birds were managed by 31% of growers by using **scare-eye balloons**. Eighteen percent of growers used *the chop and leave debris after harvest* strategy, followed by 13% of growers who used *recorded distress call devices*, 12% used *cannons*, 9% used *shell crackers*, 6% *shot* birds and 5% used Avitrol bait. Growers reported these strategies to be “good.”

Twenty-seven percent of the growers used hunting/shooting methods to manage **deer**. Other growers (13%) used electric fences, followed by 7% who used dogs, 4% who used Deer Away, 3% who used Hinder, and 2% used non-electric fences. These strategies were reported by growers as being “good.”

Raccoons were managed by 42% of growers through trapping. Seventeen percent used dogs and 16% used electric fences. These methods were reported by growers as “excellent” and “good.” In addition, seven growers used shooting as their management strategy and reported as “excellent” and/or “good” control.

Other vertebrate pests included bears, porcupines, skunks, squirrels, woodchucks, and coyotes. Four growers reported “excellent” results with shooting bears, while three other growers reported “good” results with dogs and radios. Porcupines were trapped by six growers and shot by five; both reported “good” results. Skunks were trapped by nine growers with “good” results. Squirrels were trapped by three growers with “good” results. Woodchucks were shot by four growers with “excellent” results reported. Coyotes were managed by growers with traps and smoke bombs both were reported as “good.”

Pest Management Decision Making Section

When growers were asked **who does insect trapping or field scouting on your farm**, 68% reported that the scouting was conducted by the grower. Sixteen percent reported farm employee, 13% said no one, and 11% use a private IPM scout/consultant or University/Extension scout.

Growers ranked the following factors that affect their pesticide selection decisions from very important to least important as: **effectiveness, applicator toxicity, customer relations, label restrictions, impacts on beneficials, other environmental impacts, cost per treatment, formulations, storage requirements, and size and type of packaging.**

Growers were asked how often weather forecasting information is used to help them in making pest management decisions. Growers “frequently” used **forecasts for next rain (85%), wind speed (71%), rainfall totals (50%), and temperature (34%).**

When growers were asked if weather information was readily available would they use it and 90% said yes they would use **forecasts for next rain**, 79% would use **wind speed forecasts**, 67% said they would use **rainfall totals (for effect on spray residues)** and 66% would use **temperature (for degree day models)**.

When asked which of the following personal protective equipment and protective clothing items they always wear when mixing and/or applying pesticides 81% said they use **long pants**, 62% **long-sleeved shirt**, 57% **use gloves** and 38% use a **respirator**. Thirty-two percent always use **nitrile gloves**, 26% said they always use **goggles**, 25% wear **boots**, 17% wear **latex gloves**, 16% wear **chemical resistant suits**, 14% said they use **face shield**, and less than 1% reported using **cotton gloves**.

Forty-nine percent of growers surveyed reported using a **boom sprayer without drop nozzles** for applying pesticides in sweet corn. Thirty-eight percent of the growers use an **air blast sprayer**, 24% use a **boom sprayer with drop nozzles**, 18% use a **back pack sprayer**, 6% use **other spray equipment**, 5% use a **Zea-later or other oil applicator**, and 1% reported using a **shielded spray** or **air assisted sprayer**.

Growers ranked the following sources information as being “very important” in making their pest management decisions – **New England Pest Management Guide** (66%), **newsletters** (64%), **University/Extension staff** (48%), **off-season education meetings** (47%), **other growers** (38%), **suppliers/ dealers** (34%), **Twilight meetings** (22%), **trade publications** (15%), **web sites** (12%), and less than 1% reported using **other sources**.

Of those growers who describe their crop production, 49% reported **conventional**, 44% **IPM**, 15% **organic** and 4% **other**.

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Appendix A: Pesticide Product Brand Names and Active Ingredients

Pesticide	Active Ingredient
Aatrex 4L	atrazine
Ambush	permethrin
Amine 4	2,4-D amine
Asana XL	esfenvalerate
Avaunt	indoxacarb
Basagran 4E	betazon
Baythroid 2	cyfluthrin
Bicep Magnum	metolachlor and atrazine
Bicep Lite Magnum	metolachlor and atrazine
Bravo Ultrex 82 WDG	chlorothalonil
Capture 2EC	bifenthrin
Counter 15G	terbufos
Credit	glyphosate
Cruiser 5FS	thiamethoxam
Dipel DF or ES	Bacillus thuringiensis kurstaki
Dithane	mancozeb
Dual Magnum	metolachlor
Entrust	spinosad
Eradicane 6E	EPTC and safener
Evik 80W	ametryn
Force 3G	tefluthrin
Fortress 5G	chlorethoxyfos
Frontier 6.0	dimethenamid
Gaucho 600	imidacloprid
Golden Natural Spray Oil	soybean oil
Gramoxone Max 3S	paraquat
Intrepid 2F	methoxyfenoxide
Laddox	bentazon and atrazine

Pesticide	Active Ingredient
Lannate SP	methomyl
Larvin 3.2	thiodicarb
Lasso 4EC	alachlor
Lorox 50DF	linuron
Lorsban 4E	chlorpyrifos
Maneb	maneb
Manzate	mancozeb
Metasystox-R	oxydemeton-methyl
Microtech	alachlor
Mocap 10G	ethoprop
M-Pede	potassium salts of fatty acids
Mustang	zeta-cypermethrin
Penncozeb	mancozeb
Permit 57 WDG	halosulfuron
Pounce	permethrin
Princep 80WP	simazine
Prowl H20	pendimethalin
Roundup 4S	glyphosate
Scythe 4.2	pelargonic acid
Sevin XLR Plus	carbaryl
Spintor 2SC	spinosad
Sutan+ 6.7E	butylate
Sutazine 6ME	alachlor and atrazine
Thimet 20G	phorate
Thionex 50w	endosulfan
Tilt	propiconazole
Warrior	lambda-cyhalothrin
Xentari	Bacillus thuringiensis aizawai