

New England Winter Squash Pest Management Survey Summary

**(The following survey was distributed to New England growers in the fall of 2003.
A Dillman survey methodology was used to design and conduct the survey.)**

Preliminary Card Notice sent to over 750 growers	July 2003
Winter Squash Survey sent to 759 growers in 6 states	August 2003
Reminder card sent to 450 growers in 6 states	August 2003
Second Winter squash survey sent to 450 growers in 6 states	September 2003
Data Entry Complete	December 2003

**Table: Summary of New England Winter Squash Pest Management Survey Returns
(December 2003)**

State	#Surveys Sent	#Surveys Returned	%Return	#Growing Winter Squash	#Winter Squash Acres
CT	104	57	55	9	4.49
MA	118	63	53	41	185.45
ME	226	133	59	67	75.69
NH	206	110	53	24	57.42
RI	79	38	48	7	10.75
VT	26	14	54	10	20.60
Total	759	415	55	158	354.42

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

Crop Information

Massachusetts led the reported winter squash acreage in 2002 with 185.45 acres. Followed by Maine with 75.69 acres, New Hampshire with 57.42 acres, Vermont with 20.6 acres, Rhode Island with 10.75 acres and Connecticut with 4.49 acres.

The majority of growers throughout the region did not keep track of their yield for winter squash. Growers planted approximately 54% of the winter squash acreage with Butternut varieties, followed by 19% Buttercup, 11% Acorn, 5% Hubbard, and 9% mixed varieties.

The wholesale market accounted for 46% of the winter squash harvest, followed by the retail market at 37%, processing at 14%, and remaining harvest split between U Pick and Community Supported Agriculture (CSA).

Horticultural Management

The majority of growers (72%) planted winter squash directly into the ground and some (43%) used transplants. Thirty percent of the growers used **composted manure** and 21% used **fresh manure**. **Drip irrigation** was used by 22% of the growers as were row covers. Thirty-two percent of the growers reported **importation of bee hives** for pollination.

Sixty-three percent of the growers use **soil samples** to determine their **fertilizer** needs in most years. Twenty-nine percent of the growers took soil samples annually.

Winter Squash Pest Management Overview

Growers ranked the frequency of insect pests with 67% managing cucumber beetles and 34% managing squash bugs on an annual basis. Seedcorn maggot (45%) and aphids (36%) were reported as “never a problem” by growers.

Annual broadleaf weeds were an “annual” problem for 82% of the growers, followed by annual grasses at 67%, perennial broadleaf weeds at 48%, and perennial grasses at 42%.

“Annual” vertebrate pest problems included deer for 38% of the growers, followed by woodchucks at 25%, and voles at 8%.

The mostly frequently managed diseases were powdery mildew, downy mildew, black rot and anthracnose. Growers reported that the certain viruses were “never a problem” including Papaya Ringspot virus at 41%, Watermelon Mosaic virus at 37%, Zucchini Yellow Mosaic virus at 36% and Cucumber Mosaic virus at 28%.

Insect Pest Management

Pesticide applications were applied to 80% of the winter squash to manage **cucumber beetles**. Growers (35%) used Sevin XLR Plus on 49% of the acreage. Ambush was used on 17% of the acreage, followed by Asana XL and Admire 2F on 6%, Surround on 2%, Adios on 1%, and other pesticides on 8%. The majority of growers used full rates and reported “excellent” or “good” control with these products. Other strategies for managing cucumber beetle were row covers (by 7 growers) and handpicking (by 4 growers).

Pesticide applications were applied to 28% of the winter squash to manage **squash bugs**. Growers (19%) used Sevin XLR Plus on 17% of the acreage. Ambush was used on 9% of the acreage, followed by Asana XL on 2%, PyGanic on 1% and other pesticides on 2%. The majority of growers used full rates and reported “excellent” or “good” control with these products. Other strategies for managing squash bugs were row covers (by 7 growers) and handpicking (by 4 growers).

Pesticide applications were applied to 21% of the winter squash to manage **squash vine borers**. Growers (9%) used Sevin XLR Plus on 14% of the acreage. Ambush was used on 7% of the acreage, followed by Asana XL on 3%, and other pesticides on <1%. The majority of growers used full rates and reported “excellent” or “good” control with these products.

With only 19% of the winter squash treated for **aphids**, Lannate was used on 9% of the total acres, followed by Ambush at 6%, and Fulfill at 3%. Growers used both full and reduced rates and reported “excellent” or “good” control with these materials.

Disease Management

Powdery mildew was a disease managed by 35% of the growers on 52% of the winter squash acreage. Growers (12%) used Quadris on 31% of the acreage. Bravo Ultrex 82 WDG was used on 23% of the acreage, followed by Topsin M 70W on 14%, Benlate 50SP on 13%, Kocide 4.5 LF on 13%, and Nova 40W on 6%. Other fungicides used included NuCop and Ridomil Gold on 3% and Champion Copper and Cabrio on 1%.. The majority of growers used full rates and reported “excellent” or “good” control with these products.

Pesticide applications were applied to 31% of the winter squash to manage **black rot**. Growers (9%) used Bravo Ultrex 82 WDG on 17% of the acreage. Topsin M 70W was used on 12% of the acreage, followed by Manex on 9%, Maneb 80WP on 8%, and Benlate 50SP on 3%. The majority of growers used full rates and reported “excellent” or “good” control with these products.

Pesticide applications were applied to 22% of the winter squash to manage **Anthracnose**. Manex was used on 10% of the acreage, followed by Bravo Ultrex 82 WDG on 8%, Topsin M 70W on 7%, Benlate 50SP on 4%, and Maneb 80 WP on 2%. The majority of growers used full rates and reported “good” control with these products.

Pesticide applications were applied to 22% of the winter squash to manage **downy mildew**. Ridomil Gold/Bravo WP was used on 14% of the acreage, followed by Ridomil Gold MZ on 8%, Manex on 5%, and Maneb 80WP on 2%. The majority of growers used full rates and reported “excellent” or “good” control with these products.

Pesticide applications were applied to 20% of the winter squash to manage **angular leaf spot**. Kocide 4.5 F was used on 14% of the acreage, followed by Manex on 10%, Basicop 53 WP on 1%. The majority of growers used full rates and reported “excellent” or “good” control with these products.

Scab was managed using pesticides application on only 12% of the winter squash. Bravo Ultrex 82 WDG was applied to 12% of the winter squash. Growers used full rates and reported good control.

Pesticide applications were applied to 8% of the winter squash to manage **Phytophthora Blight and Fruit Rot**. Aliette WDG was used on 4% of the acreage, followed by Ridomil on 3%, and Bravo, Copper, and Kocide on less than 1%. Growers used full rates and reported “excellent” or “good” control with these products.

Crop rotation was used by 83% of the growers to manage diseases. Twenty-six percent rotated their crops every two years, 36% every three years and 14% every 4 years.

Forty-five percent of the growers used one or more **cultural practices** to control diseases in winter squash. Many used crop rotation, followed by **cultivation** (7%), **weeding** (7%), **black plastic** (6%), **wide plant spacing** (4%) and many others including row covers, compost, cover crop, drip irrigation, and raised beds.

Weed Management

Twenty percent of the winter squash acreage received **stale seedbed** herbicide applications. Roundup was applied to 7%, followed by Dual and Gramoxone on 6%, Scythe 4.2 on 3% and Prefar 6E on <1%. Growers used both full and reduced rates and reported “excellent” or “good” control.

Forty-six percent of the winter squash acreage received **preplant incorporated** herbicide applications. Curbit 3 EC was applied to 29% of the acres, followed by Command 4EC on 8%, and Prefar 6E on 3%. Other herbicides used included Dual, Strategy, Sandea and Roundup. Growers used full rates and reported “excellent” or “good” control.

Postemergence herbicide applications were applied to 21% of the acres. Poast 1.5L was applied to 10% of the acres, followed by Gramoxone Max on 6%, Sandea on 4%, Select 2 EC on 3%, Strategy on 3% and Command on 3%. Other herbicides used include Analap, Curbit, and Roundup. Growers used full rates and reported “excellent” or “good” control.

Forty-six of the growers reported using **cover crops** for weed management in winter squash. Of those growers who used cover crops, most (87%) used winter rye and reported “good” for weed suppression. Others used oats (28%), buckwheat (15%), and red clover (15%). They also reported “excellent” or “good” weed suppression.

Growers (92%) used other cultural weed management strategies including **cultivation** (83%), **hand weeding** (80%), **mulching** (26%), **mowing** (15%), and **black plastic** (10%). Most reported “excellent” or “good” weed management.

Vertebrate Pest Management

Forty-two percent of the growers reported vertebrate pest problems. Deer and woodchucks were most often reported by growers. Twenty-seven percent of growers used various management strategies for **deer** including electric fences (8%), off-season permit (6%), other fencing (4%) and repellents. Nineteen percent of the growers had problems with **wood chucks** and they used rifles (5%), smoke bombs (5%), traps (4%), and dogs (3%).

Information for Pest Management Decisions

Fifty-four percent of the growers implemented **IPM practices** such as insect trapping, and field sampling. Many of them (82%) did their own **scouting**, but some had a farm employees/family members (13%), or private consultants (13%) to conduct the scouting. Those who used **sampling methods** used informal sample patterns (68%), standardized sample patterns (12%) and insect traps (6%).

Factors that were “very important” in choosing a pesticide were **effectiveness** (71%), **toxicity** of pesticides (61%), **phytotoxicity** (56%), potential **environmental impacts** (55%), impacts on **non-target organisms** (46%), **packaging** (30%), and **cost per acre** (30%).

Weather information was used frequently to make pest management decisions. Seventy-seven percent of the growers frequently use rain forecasts, followed by wind speed forecasts (53%), rainfall totals (38%), humidity (32%), and temperatures (23%). Thirty-five percent of the growers would base their irrigation schedule on observed and/or forecast weather.

Growers ranked the following sources information as being “very important” in making their pest management decisions – **New England Vegetable Management Guide** (48%), **off-season education meetings** (41%), **newsletters** (40%), **other growers** (39%) and **University/Extension staff** (39%). “Somewhat important” were suppliers/dealers (38%), trade publications (35%), twilight meetings (35%), and web sites (26%).

Of those growers who describe their crop production, 44% reported **conventional**, 35% **organic**, and 26% **IPM**.

Additional Survey Information

To obtain a copy of the survey and complete results please refer to the New England Pest Management Information Network website at www.pronewengland.org

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