

CORN, SWEET

Sweet corn is a warm-season crop and one of the major vegetables grown in New England. It is an extremely popular crop for roadside stand sales.

Sweet corn grows on a wide range of soil types. Early planting should be on light, well-drained soil in a warm, sheltered location. Heavier soils are best for the main crop. Plowing under corn stalks and cover crops to maintain high levels of organic matter in soils is recommended for best crop production. Irrigation may be necessary in dry weather, particularly on light soils, and especially as silking starts.

First plantings are made in early April in southern New England and in May in northern New England. Growers planting in cold soils run the risk of erratic germination and poor stands. Avoid planting while soil temperature is lower than 55°F. If soil temperature is below 60°F, it is advisable to plant treated seed. If you are planting untreated seed, wait until the soil temperature is at least 65°F. Most seed companies perform cold germination tests on their seed. If in doubt about the suitability of a corn variety for early planting, ask your seed dealer about the low temperature germination and vigor of the seed. Clear plastic mulch raises soil temperature and can be used for the earliest plantings. This can provide corn 7 to 10 days earlier than nonmulched corn. Apply fertilizer and herbicides, and plant seed before laying the plastic over seeded rows. Two rows 18" to 24" apart are usually planted under each strip of 5'-wide plastic. A floating row cover can be used to warm the soil prior to planting.

To avoid heat injury, do not let temperatures beneath the plastic get too high (90°F or more). When such conditions occur, or when the plants reach 4" in height, cut slits in the plastic to allow heat to escape and plants to grow through. Remove the plastic completely by the time the corn is knee high to facilitate removal and permit cultivating.

Spunbonded row covers offer a potential three-way benefit for early sweet corn production. Maturity is increased by 5 to 10 days, yields are generally increased by 15 to 20%, and the first generation corn borer can be controlled if the covers are left on until after the peak of the first generation corn borer flight. They can also be used to pre-warm the soil before planting. They can be removed to allow planting and then replaced. Weight edges with soil to prevent damage by gusty winds, but leave adequate slack for plant growth to the tassel stage.

■ Sweet Corn Varieties

Sweet corn varieties are categorized by their genotype. The most common varieties are normal or sugary (su), sugar enhanced (se), and supersweet or shrunken types (sh2). Other newer varieties include sweet breeds, synergistic, sweet genes, or improved supersweets which have a combination of genes.

su "Normal or Sugary"

Standard hybrid sweet corn is a mutant type of corn that differs from field or dent corn by a mutation at the sugary (se) locus. The standard hybrid sweet corn accumulate about two times more sugar than field corn.

se "Sugary Enhanced" or "Modified Sugar" or "Everlasting Heritage" (EH)

se+ Homozygous Sugary Enhanced

There are two distinct groups within the cultivars containing the "se" gene. Firstly, there are the "Homozygous se" or se+ cultivars. They have higher sugar levels in 100% of their kernels. The other group includes cultivars containing the "Heterozygous se" gene. They have higher sugar levels in 25% of their kernels; the other 75% contain the normal su gene with lower sugar level. So "Homozygous se" cultivars are usually sweeter than "Heterozygous se" cultivars.

- Sugar conversion to starch is about the same rate as standard sweet corn. Refrigeration is essential to maintain quality.
- Isolation not required, but desirable. Note directions on seed tag label.
- Kernels tender and creamy.
- Tip cover weak on some varieties.

sh₂ "Super Sweet or Extra Sweet"

- Sugar content twice as high as standard sweet corn.
- Slow sugar conversion to starch so quality will hold 7 to 10 days. Refrigeration suggested to extend quality.
- Isolation is required from all other types of corn. Note directions on label.
- Kernels can be somewhat tough or crunchy.
- Does not germinate well in cold, wet soil. Plant after soil temperatures exceed 65°F and be sure there is adequate soil moisture. Adjust planting depth for soil conditions and

Plant Nutrient Recommendations According to Soil Test Results for Sweet Corn										
SWEET CORN	Nitrogen (N)* Lbs per acre	Phosphorus (P) Lbs P ₂ O ₅ per acre					Potassium (K) Lbs K ₂ O per acre			
		Very Low	Low	Med	High	Very High	Very Low	Low	Med	High
Soil Test Results										
Early Season Sweet Corn										
Broadcast and Incorporate	0	70	40	0	0	0	160	120	90	0 0
Band Placement at Planting	40	40	40	40	40**	40**	40	40	40	0-30 0
Sidedress	60-90***	0	0	0	0	0	0	0	0	0 0
TOTAL RECOMMENDED	100-130	110	80	40	40**	40**	200	160	130	0-30 0

* See pages 5 to 16 for information on nutrient management and application.
 ** Phosphorus is not necessary for warmsoils.
 *** Before sidedressing use a nitrate test to determine the need for additional N. See page 8.

soil type. Seed of the sh type is light-weight, wrinkled, and fragile and should be handled gently to prevent damage.

Others

These include synergistic or improved supersweets such as Sweet Breed and Sweet Genes. Sweet corn breeding programs have developed varieties that have combinations of su, se, se+, or sh₂ genes. Synergistic varieties having the sh₂ gene may be grown with other “Super Sweet” varieties, but must be isolated from se and su types to achieve best quality.

■ Varieties

Variety	Days to maturity	Genetics	Color	SW	Rust	MDM
Seneca Arrowhead	62	se	Bi	M	M	L
Seneca Daybreak	64	se	Y	M	Yes	
Frisky	65	se+	Bi			
Fleet	66	se+	Bi	M	M	L
Sweet Chorus	67	syn	Bi	L	M	M
Mirai 308BC	70	sh2	Bi	-	-	-
Temptation	72	se+	Bi	M	M	-
Reflection	72	syn	Bi	-	M	-
Sweet Rhythm	73	syn	Bi	M	L	No
Nantasket	73	syn	Bi	-	-	-
Sweet Ice	74	syn	W	M	L	L
Kristine	74	syn	Bi	M	M	-
Ambrosia	75	se+	Bi	H	M	L
Mystique	75	se+	Bi	H	M	L
Bodacious	75	se+	Y	M	M	L
Tuxedo	75	se+	Y	H	H	L
Mirai 301BC	76	sh2	Bi	M	M	
Sweet Symphony	76	syn	Bi	M	L	Yes
Candy Corner	76	sh2	Bi	M	H	H
Luscious	77	se	Bi	-	-	-
Ice Queen	77	sh2	W	M	H	H
Accord	78	se	Bi	-	-	-
Providence	79	syn	Bi		M	
Montauk	79	syn	Bi	M	-	-
Delectable	80	se+	Bi	M	H	L
Precious Gem	80	se+	Bi	M	M	L
Jackpot	82	se+	Bi	M	Yes	-
Lancelot	82	se+	Bi	H	H	-
Silver King	82	se+	W	Yes	M	No
BC 805*	82	se	Bi	-	H	-
Argent	83	se+	W	H	M	L
Incredible	85	se+	Y	H	-	-
Seneca Dancer	92	se+	Bi	M	M	L
Silver Queen	94	su	W	H	L	L

SW: Stewart's Wilt

su: normal sugary

MDMV: Maize Dwarf Mosaic Virus

se: sugary enhanced

H, M, L: High, Medium, or Low

se+: homozygous

level of tolerance

sh₂: shrunken

syn: has su, se, sh₂ genes; Sweet Breed[®], one trade name of syn

*Bt varieties - These are genetically-modified (GM) varieties that are protected from European corn borer, and to a lesser extent fall armyworm and corn earworm caterpillars, because they express the protein toxin of the bacteria *Bacillus thuringiensis*. They are currently available as super sweet (sh₂) or as synergistic, “TripleSweet” varieties, composed of 75% sugar enhanced (se) and 25% sh₂ kernels. In the synergistic varieties, the Bt toxin is expressed in the se kernels, the stalks, leaves, tassels and the fresh silk. Bt varieties are still susceptible to attack from flea beetles, cutworms, aphids, sap beetles, high levels of corn earworm and soil-dwelling insects. Bt seed costs more than the seed of other sweet corn varieties and currently comes with a list of resistance management strategies to comply with. These varieties may reduce the time, energy and expense associated with insect control and may simplify sweet corn pest management. There are many other less obvious potential risks and benefits that may be associated with the use of this technology. GM sweet corn is not allowed in organic production or in the state of Maine.

■ Spacing and Seeding

Effective isolation is required in some cases with the present types of sweet corn on the market. Isolation is affected by distance, wind direction, time of pollen shed and silking, and blocking. From a practical standpoint, the same methods are needed as when separating white and yellow varieties. Field experience indicates isolation can be managed more easily than initially expected.

Plant early varieties 8" to 10" within rows and 30" to 36" between rows. Plant main season varieties 10" to 12" within rows and 36" between rows. This requires 10 to 15 lb of seed/A, or 17,500 to 26,000 seeds/A for early and 14,500 to 17,500 for main season varieties. Match seed size to seed plate.

■ Lime

Apply lime according to soil test to maintain soil pH between 6.5 to 6.8.

■ Fertilizer

Less nitrogen fertilizer will be needed if manure or legume sod was plowed down (see pages 6 to 9 for information on nitrogen credits).

Apply no more than 80 to 100 pounds per acre combined weight of actual nitrogen and potash applied 2" on the side and 2" below the seed as a band. Higher amounts of nitrogen and potash applied as a concentrated band may damage corn seed and young plants.

WEED CONTROL

▼DELAYED HERBICIDE APPLICATIONS

Growers using atrazine (Aatrex) for broadleaf weed control and either metolachlor (Dual) or alachlor (Lasso) for grass control in corn should consider delayed applications in their earliest plantings. Reasons for delaying herbicide applications in the earliest sweet corn plantings include:

1. Corn is most tolerant to both Dual and Lasso after emergence. Supersweets and some “se” sweet corn are easily injured by these herbicides when the soil is below 60°F. Both Dual and Lasso as well as atrazine can be applied at any time as long as the corn is less than 5" high. Bicep, a very commonly used prepack of atrazine and Dual, can also be used this way.

2. If the first few plantings of sweet corn are sprayed on the same day, the amount of cleaning and rinsing of the spray tank is reduced since it does not need to be cleaned between applications when the same herbicide is used.

3. Delaying herbicide applications on the earliest plantings will also extend the activity of the herbicide later into the season. This is important in maintaining good weed control throughout the season to minimize weed seed production. Growers often rely on sweet corn rotations to reduce weed seed populations in the soil.

Growers should consider waiting until their first planting of sweet corn is 3" to 5" high to apply herbicide. At this time

all fields of sweet corn planted to date can be treated. Each field sprayed will be at a different stage of growth. After that, each field should be sprayed soon after it is planted, since soils will be warmer and grasses are more likely to emerge soon after seeding the crop.

The only possible problem with delayed applications involves the potential for poor activity on grasses. The Dual, Lasso, or Bicep (atrazine + Dual) must be applied before grasses emerge. If grasses are not controlled, yield reductions will likely occur. Also, as the soil warms up, grasses are likely to emerge soon after seeding. In all cases, be sure that the atrazine + Dual, atrazine + Lasso, or Bicep is applied before grasses emerge.

Finally, be sure to follow the herbicide rates recommended in this guide. Only 1 lb active ingredient of atrazine is recommended for sweet corn in New England. This is well below the rate on the label and constitutes best management practices for groundwater protection. This rate could be reduced further, although the grower should be prepared to make a second application of atrazine if any weeds escape. Rates for Dual and Lasso should be selected based on soil type. Follow the label to determine the correct rate. Reducing the rate of Dual or Lasso is dangerous since it is very difficult to control grasses in sweet corn once they emerge.

▼SPECIAL ATRAZINE PRECAUTIONS

The Environmental Protection Agency and Ciba Geigy have revised the label uses of all atrazine products to reflect potential surface and groundwater contamination concerns. Be sure to read and follow all directions and restrictions listed on the label. The preceding section on Reduced Rate Weed Management reflects these concerns. All of the rates listed in this guide for atrazine are within the guidelines of the label. These include both single applications (applied before crop emergence or early postemergence) and sequential applications (applied both at planting and postemergence). Please read the label carefully.

▼STALE BED APPLICATIONS

The following herbicides are nonselective and are used to control weeds which are present in a field prior to planting the sweet corn or before the sweet corn emerges (see Stale Seedbed Technique on page 44). If a grower is using "no-till" or "minimum tillage," these herbicides are also used to kill the cover crop which may be present in the field.

glyphosate (Roundup 4S): 1 to 5 qt/A (REI 12h, Group 9). Apply to emerged annual or perennial weeds prior to crop emergence. Do not feed crop residue to livestock for eight weeks following treatment. Consult the manufacturer's label for specific weeds and rates. May be tank mixed with atrazine, simazine or alachlor.

paraquat (Gramoxone Inteon *2S): 2.0 to 4.0 pt/A (REI 12h, Group 22). Apply in 20 to 60 gallons spray mix to emerged annual weeds before crop emergence as a broadcast or band treatment. Field should be prepared several days ahead of planting and treatment to allow maximum weed emergence. Plant with a minimum of soil movement for best results. Use a nonionic surfactant at a rate of 16 to 32 oz per 100 gal spray mix. May be tank mixed with atrazine or simazine preemergence. Check label for directions.

pelargonic acid (Scythe 4.2): 3 to 10 gal/A (REI 24h, Group 27). See Stale Seedbed Technique on page 44.

GRASS WEED CONTROL

▼SOIL-APPLIED GRASS HERBICIDES

The following herbicides control most annual grasses as well as certain smaller-seeded broadleaf weeds. Some growers may find that the weed control spectrum of these herbicides may be sufficient to allow use of only one of these herbicides without the addition of a broadleaf-weed herbicide.

dimethenamid (Frontier 6.0): 16 to 32 ounces/A (50 dh, REI 12h, Group 15). May be applied preplant surface, preplant incorporated, preemergence, or postemergence (up to 8" tall corn). A split application may be used. Will not control emerged weeds. Check with seed supplier for potential varietal susceptibility to injury.

pendimethalin (Prowl H20): 2 to 4 pt/A (REI 24h, Group 3). Apply preemergence only after seeding. Do not incorporate into the soil. A broadleaf herbicide such as atrazine or simazine should also be used to control broadleaf weeds. If this herbicide is moved into the seed zone, there is potential for crop injury. Some basic suggestions for minimizing the potential for crop injury are to plant in a firm seedbed, plant corn seed at least 1.5" deep, plant into moist rather than dry soil, do not mix Prowl with liquid fertilizers, and avoid sandy soils. If the soil is dry, consider irrigating instead of waiting for rainfall prior to application. If heavy rains follow an application to dry soil, Prowl can move to the seed zone and cause crop injury. Specific weeds for which this herbicide should be considered include triazine-resistant lambsquarters, and velvetleaf. Growers may consider a lower rate of Prowl in addition to using a broadleaf herbicide and another grass herbicide such as Dual Magnum (metolachlor), Lasso (alachlor), Frontier (dimethenamid), Sutan+ (butylate) or Eradicane (EPTC+safener).

Preplant Incorporated Herbicides (Thiocarbamate Family): These herbicides must be broadcast over the soil surface and incorporated prior to seeding.

butylate (Sutan+ 6.7E): 3 3/4 pt/A (REI 12h, Group 8). Apply before planting and immediately work into soil with a disc to a depth of 2" to 3" for annual grasses and 4 to 6" for nutsedge. Weak on many broadleaf weeds. May be tank mixed with atrazine or cyanazine to improve broadleaf weed activity.

EPTC + safener (Eradicane 6E): 2 7/10 to 4 qt/A (REI 12h, Group 8). Provides similar grass weed control to butylate but offers better control of pigweed and velvetleaf. Must be incorporated immediately to a depth of 2" to 3". May be tank mixed with atrazine or cyanazine to improve broadleaf weed activity.

▼SOIL SURFACE APPLIED HERBICIDES (ACETANILIDE FAMILY)

These herbicides are usually applied to the soil surface immediately after seeding. They can also be applied after crop emergence as part of a reduced rate program.

alachlor (Lasso 4EC): 2 to 3 qt/A (REI 12h, Group 15). Apply to the soil surface after seeding. Generally weak on lambsquarters and ragweed. May also be applied after crop emergence to weed-free soil before crop is 5" tall. May cause some temporary crop burn if applied after corn emergence.

metolachlor (Dual Magnum): 1/2 to 2 pt/A (REI 12h, Group 15). Apply to the soil surface after seeding. Poor control of lambsquarters. May also be applied after crop emerges to weed-free soil before crop is 5" tall.

▼POSTEMERGENCE APPLIED GRASS HERBICIDES

pelargonic acid (Scythe 4.2): 3% to 10% (REI 24h, Group 27). Use a 3-5% solution for annual weeds (4-6 oz/gal water), a 5-7% solution for biennial and perennial weeds (6-9 oz/gal water), and 7-10% solution for maximum burndown (9-13 oz/gal water). Delivery rate for boom applications should be 75 to 200 gal spray solution/A; complete coverage of weed foliage is essential. Use a DIRECTED/SHIELDED SPRAY; contact with crop will cause injury. For hand-held equipment, spray to completely wet all weed foliage but not to the point of runoff. Repeat applications as necessary. Tank mixes are allowed with this product. These include tank mixes with glyphosate (Roundup), sulfosate (Touchdown), and residual herbicides. See label for complete details.

BROADLEAF WEED CONTROL

▼SOIL-APPLIED BROADLEAF HERBICIDES (TRIAZINE FAMILY)

The following herbicides provide excellent control of most broadleaf weeds and are commonly used as a supplement to one of the grass herbicides discussed above. Although these herbicides are usually applied to the soil surface immediately after seeding, they can also be soil incorporated if tank mixed with a preplant incorporated grass herbicide.

atrazine (Aatrex 4L): 1 qt/A (REI 12h, Group 5). Apply preplant incorporated or to the soil surface immediately after planting. Use alone only if annual grasses are not a problem. Shallow cultivation may help to control annual broadleaf weeds. May be tank mixed with butylate, EPTC + safener, alachlor, metolachlor, glyphosate or paraquat.

simazine (Princep 80WP): 2 1/2 to 3-3/4 lb/A (REI 12h, Group 5). Apply preplant incorporated or to the soil surface immediately after planting. Use alone only if annual grasses are not a problem. May be tank mixed with EPTC + safener.

▼SOIL-APPLIED BROADLEAF HERBICIDES (NEW CHEMISTRY)

mesotrione (Callisto 4EC): Apply 6.0 to 7.7 oz/A (45 dh, REI 12h, Group 28). Apply after seeding to the soil surface. Use 5 to 6 oz/A if tank mixing with atrazine. In a tank mix, the atrazine rate can be reduced to 0.5 to 1 pt/A. A grass herbicide must also be used. Callisto provides excellent control of many problem broadleaf species such as velvetleaf and triazine-resistant lambsquarters. On cool soils in the spring, Callisto may be a better option than using Prowl to control these two weed species. Callisto does not provide

preemergence control of yellow nutsedge. With this weed, it is important to continue to use atrazine (alone or in combination with Callisto) as well as either Dual or Lasso preemergence. A preplant incorporated application of either Eradicane or Sutan+ will also have activity on yellow nutsedge. See the label for precautions and more information on tank mixes, rates, and weeds controlled.

▼POSTEMERGENCE APPLIED BROADLEAF HERBICIDES

The following herbicides are applied after broadleaf weeds have emerged. They can be used as the only broadleaf weed control to supplement a soil applied grass herbicide or they can be used as an emergency treatment if the soil applied broadleaf herbicide fails to provide adequate control. Timing is very important when using these herbicides. Be careful to check both the ideal weed stage of growth as well as the ideal timing and application precautions for the crop.

ametryn (Evik 80W): 2 to 2 1/2 lb/A (REI 12h, Group 5). Apply as a postemergence directed spray on weeds after corn is at least 12" tall. Do not spray overtop of corn. Do not spray within three weeks of tasseling. See label for additional precautions and specific information on weed size and proper rate. Evik should be primarily used as an emergency treatment when grasses and broadleaf weeds are emerging and the use of 2,4-D is not desirable.

atrazine (Aatrex 4L): 1 qt/A, (REI 12h, Group 5). Add either 1 qt/A of crop oil concentrate or 1 gal/A of spray oil. Apply when weeds are 1 to 1 1/2" high and before corn is 12" high. This treatment can be used as the primary broadleaf herbicide treatment instead of an application at planting or it can be used as an emergency treatment if the soil-applied broadleaf herbicide treatment failed. If applied correctly, this application will control the emerged weeds and will continue to provide residual control for later-emerging broadleaf weeds. Check label for additional precautions regarding the use of crop oil and petroleum oils.

bentazon (Basagran 4E): 1 1/2 pt/A (REI 48h, Group 6). Apply early post-emergence overtop when weeds are small and corn has one to five leaves. See label for ideal weed size. Bentazon will not control redroot pigweed and will provide only partial control of common lambsquarters, giant ragweed and morning glory. Bentazon should be primarily used as an emergency treatment when a soil-applied broadleaf herbicide has failed. There is less chance of adjacent crop injury from spray drift than with 2,4-D.

carfentrazone (Aim 40 WG): 0.33 to 0.67 oz/A (REI 12h, Group 14). Apply before corn reaches 8" in height to control seedling broadleaf weeds including pigweed, common lambsquarters, eastern black nightshade, and velvetleaf. Tank mix with atrazine at reduced rates or another broadleaf herbicide to increase the spectrum of weeds controlled. Add non-ionic surfactant at a rate of 1 qt/100 gal spray solution. Expect to see speckling of the crop foliage after application. Initially, the injury appears to be substantial, but it is not systemic and the corn outgrows the injury rapidly. Cultivar sensitivity may vary with Aim. Use caution when treating new cultivars. Weather conditions may also affect the degree of injury observed. Injury may be more severe during periods of warm, cloudy weather with high humidity and plentiful soil moisture

when corn growth is rapid and soft. If corn is over 8" tall, use drop nozzles to avoid spraying both into the whorl and the corn foliage.

halosulfuron (Permit 75 WSG): 2/3 to 1 1/3 oz/A (REI 12h, Group 2). This herbicide provides postemergence control of many weed species which are not under drought stress. It is rainfast in 4 hours. Use a non-ionic surfactant at a rate of 1 to 2 qt/100 gal spray or a crop oil concentrate at 1 gal/100 gal spray. Control varies with type and size of weed. Species listed on the label include redroot pigweed, pokeweed, common ragweed, Pennsylvania smartweed, common sunflower, velvetleaf, wild mustard, yellow nutsedge, and wild radish. Do not cultivate for 7 days after application. Most vegetables can be planted within 12 months of application except crucifers, carrot, leeks, onions, lettuce, beets, and spinach. Some sweet corn varieties may be injured by Permit and no reliable list of susceptible varieties has yet been developed. Regular sugary varieties do not appear to be more tolerant than se (sugar enhanced) types or sh2 (supersweet) types. Initially, this herbicide should be used on a small scale to control problem weeds such as yellow nutsedge, ragweed and velvetleaf, and triazine-resistant lambsquarters. Other postemergence options continue to exist. These include Aatrex (atrazine), Basagran (bentazon), Amine 4 (2,4-D), Lorox (linuron), and Evik (ametryn). Atrazine, Basagran, and 2,4-D have been the most commonly used.

linuron (Lorox 50 DF): 1 1/4 to 3 lb/A (REI 24h, Group 7) Use only as a postemergence-directed treatment to corn at least 15" high. Use lower rates on weeds less than 2" in height and higher rates on weeds up to 5" in height. Add 1 pt of surfactant for each 25 gals of spray mixture.

mesotrione (Callisto 4EC): Apply 3 oz/A (45 dh, REI 12h, Group 28). Apply postemergence to corn (up to 30" tall) when weeds are no more than 3" tall. Do not make more than 2 applications per season to corn and do not exceed a total of 7.7 ounces per acre of Callisto. Callisto provides excellent control of many problem broadleaf species such as velvetleaf and triazine-resistant lambsquarters. Callisto provides only partial control of yellow nutsedge and no control of ragweed when applied postemergence. Use other options if these weeds are present. See the label for precautions and more information on tank mixes, rates, and weeds controlled.

2,4-D amine (Amine 4): 0.5 to 1 pt/A (REI 48h, Group 4). Use 0.5 pt/A when weeds are small and corn is 4" to 5" tall. Increase rate to 1 pt/A as corn reaches 8" tall. Use drop nozzles to direct spray toward base if corn is over 8" tall. Do not cultivate for about 10 days after spraying, as corn may be brittle. Reduce rate of 2,4-D if temperature is hot and soil is wet. Use only the amine formulation of 2,4-D; Do not use any ester or low-volatile ester formulations. Use all precautions to avoid spray drift to desirable broadleaf crops.

pelargonic acid (Scythe 4.2): 3% to 10% (REI 24h, Group 27). Use a 3-5% solution for annual weeds (4-6 oz/gal water), a 5-7% solution for biennial and perennial weeds (6-9 oz/gal water), and 7-10% solution for maximum burndown (9-13 oz/gal water). Delivery rate for boom applications should be 75 to 200 gal spray solution/A; complete coverage of weed foliage is essential. Use a

DIRECTED/SHIELDED SPRAY; contact with crop will cause injury. For hand-held equipment, spray to completely wet all weed foliage but not to the point of runoff. Repeat applications as necessary. Tank mixes are allowed with this product. These include tank mixes with glyphosate (Roundup), sulfosate (Touchdown), and residual herbicides. See label for complete details.

PERENNIAL WEED CONTROL

Several perennial weed species, including quackgrass, bindweed and milkweed, may be present in a corn field. The grass and broadleaf herbicides described above will have limited activity on these weeds. Use of glyphosate as described below can provide excellent control of these perennial weed species.

glyphosate (Roundup 4S): 1 1/3 oz/gal (REI 12h, Group 9). Apply as a spot treatment BEFORE silking of corn. Do not treat more than 10% of the total field area to be harvested. Any crop plants receiving spray in the treated area will be killed.

glyphosate (Roundup 4S): 2 qt/A (REI 12h, Group 9). Apply AFTER corn harvest to actively growing quackgrass 6" to 8" high. Wait at least five days and then plow. Do not plant subsequent crops other than those on the label for 30 days following application. Most effective on bindweed and milkweed at or after bloom.

FORMULATED MIXES (PREPACKAGED TANK MIXES)

In recent years, several products have come on the market as formulated combinations of herbicides which were often recommended in the past as tank-mix combinations of products purchased separately. Following is a list of some formulated mixes registered for use on sweet corn:

Formulated Mix	Individual Herbicides Contained in Mix
Bicep Magnum, Bicep Lite Magnum (Aatrex)	metolachlor (Dual, Group 15) + atrazine (Aatrex, Group 5)
Laddock (Aatrex)	bentazon (Basagran, Group 6) + atrazine (Aatrex, Group 5)
Lariat	butylate (Sutan+, Group 8) + atrazine (Aatrex, Group 5)
Lexar and Lumax	atrazine (Aatrex, Group 5) + metolachlor (Dual, Group 15 + mesotrione (Callisto, Group 28)
Sutazine 6-ME	alachlor (Lasso, Group 15) + atrazine (Aatrex, Group 5)

There are three questions that a grower or pesticide applicator should ask when deciding whether to use a formulated mix or the individual herbicide. (1) Which is less expensive on a per acre basis? (2) Which formulation is easier to apply? (Most pesticide applicators prefer to avoid wetttable powders, for example.) and (3) Is the ratio of the two herbicides in the formulated mix appropriate for the given field situation?

For example, Bicep Lite contains 2/3 as much atrazine as Bicep and should allow growers a better opportunity to obtain good grass control without using more atrazine than is needed.

Dual II, Bicep II, and Bicep Lite II are newer formulations which contain a safener. The safener is designed to improve the tolerance of corn to metolachlor in cold soils. For supersweets and “se” sweet corn, it is still highly recommended to wait until soil temperatures reach 60°F before planting.

INSECT CONTROL

▼SPRAYER TYPE AND CONFIGURATION

Best coverage is achieved by using a boom-type sprayer with drop nozzles. The nozzles should be arranged so that one nozzle is over the row, one nozzle is directed up toward the ear and one nozzle is directed down: hence, sandwiching the ear between the spray paths. TX-10 or D2-25 hollow-cone nozzles at 75 to 100 psi provide excellent coverage. Do not use flat-fan nozzles or nozzles that produce large droplets. For more information, see references #15, #18, and #39 in References For Commercial Vegetable Growers section on page 209.

Mist blowers provide the poorest coverage, as it is not possible to concentrate the spray on the ear zone with this type of sprayer. If a mist blower is used, check to make sure ears are being covered by placing water-sensitive cards on ears across the rows and on ears on both sides of the plant. Check the cards for coverage after a test application of water. Remember that each row of corn acts as a filter, removing insecticide from air as it passes across each row.

▼EUROPEAN CORN BORER (ECB)

European corn borer (ECB) is a resident pest that has two generations per year in southern and central New England and one generation in northern New England. Sweet corn is one of over 200 crop and weed host plants of this pest. Larvae overwinter in stalks of corn and other host plants and pupate in the spring. Adult moths emerge in late May or early June and mate in weedy or grassy areas. The moths are about 3/4" long, light brown in color with lighter bands on the wings. Three to seven days after emergence (depending on temperature), females begin to lay flat, white egg masses on the underside of leaves in early corn. Eggs hatch in about 5-7 days (100 degree days, with a base temperature of 50°F).

ECB larvae are light colored, with a pattern of small dark spots on each segment. The head capsule is flattened and black or dark brown. Newly hatched larvae are 1/8 inch long and full-grown larvae are 3/4 to 1 inch long. Larvae feed in the whorl, leaving pinhole damage, and in the succulent emerging tassel creating brown frass in the florets. As the corn matures, these larvae move downward, bore into the stalk and tunnel into ears through the side or tip. Pupae form inside larval tunnels in the stalk. A second flight begins in mid July to mid August, depending on location. When moths are active during silking, eggs are laid on leaves near the ear and larvae move directly into the ear by tunneling through the husk or down the silk channel. Check with your state IPM program for specific timing and thresholds.

ECB flight can be monitored with two Scentry Heliothis net traps baited with New York (E II) or Iowa Z (I) lures,

placed at least 50 feet apart in weedy borders of corn fields with the bottom at weed height. Both types of lures are needed in New England because both E and Z strains are present. Check traps once or twice per week and replace lures every two weeks.

Once flight is detected, corn with newly emerging tassels should be scouted weekly for the presence of ECB larvae by inspecting the tassels of 50-100 plants, in groups of five to twenty plants throughout the field. Treat if more than 15% of the plants have one or more larvae present. A sprayer configuration with one nozzle directed into the tassel and a single drop nozzle to the upper parts of the plant gives the best control. At high levels of infestation, two applications may be needed to provide control.

Since the ECB overwinters as a mature larva in corn stalks and stubble, plowing under corn refuse in the fall or early spring will help control this pest. Fields that have been in sweet corn or field corn for a long time tend to have higher pressure from ECB.

Corn grown under plastic matures sooner in the year, so developing ears may be present during the first flight of ECB. Because of this synchrony between developing ears and ECB egg laying, corn grown under plastic can be heavily infested by this pest. If plants are in silk and moths are active, protect developing ears. This is also true for late season corn, especially when other caterpillar pests are absent.

Natural enemies include the twelve spotted ladybeetle which preys on eggs and small larvae. Releases of *Trichogramma ostriniae*, which attacks ECB eggs, can reduce the need for insecticide applications. See Biological controls or References for more information. Use of selective products to control ECB will conserve natural enemies of aphids and ECB.

***Bacillus thuringiensis aizawai* (XenTari):** 1/2 to 2 lb/A (0 dh, REI 4h, Group 11). OMRI listed.

***Bacillus thuringiensis kurstaki*:** Follow manufacturer's directions regarding rates. (0 dh, Group 11.) Ensure good coverage and use a spreader sticker. Use a shorter spray interval (four to five days) and high rates under high borer pressure. See Insect Management section for additional information on *B.t.* products. Many products OMRI listed.

bifenthrin (Capture* 2EC): 2.1 to 6.4 oz/A (1 dh, REI 12h, Group 3A). Use prohibited on corn in all coastal counties.

cyfluthrin (Baythroid* 2): 1.6 to 2.8 oz/A (0 dh, REI 12h, Group 3A).

deltamethrin (Decis* 1.5EC): 1.5 to 2.4 oz/A (1 dh, REI 12h, Group 3A).

esfenvalerate (Asana* XL): 5.8 to 9.6 oz/A (1 dh, REI 12h, Group 3A).

gamma-cyhalothrin (Proaxis*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

indoxacarb (Avaunt): 2.5 to 3.5 oz/A (3 dh, REI 12h for mechanically harvested and 14 days for hand harvested, Group 26). Whorl through tassel emergence (prior to silking) application only.

lambda-cyhalothrin (Warrior*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

methomyl (Lannate SP*): 1/4 to 1/2 lb/A (0 dh for ears, 3 dh if used for feed or forage, REI 48h, Group 1A). Treat a small area of the field to determine cultivar sensitivity before spraying entire field. Phytotoxicity may occur on some varieties. More severe damage may occur with the Lannate* LV formulation than with the Lannate* SP (Soluble Powder) formulation.

methoxyfenozide (Intrepid 2F): 4 to 8 oz/A (3 dh, REI 4h, Group 18). Insect growth regulator. Stops larval feeding within hours but takes several days to cause complete mortality.

permethrin (Pounce*): 4 to 8 oz/A (1 dh, REI 12h, Group 3A).

spinosad (Entrust): 0.5 to 2 dry oz/A (1 dh, REI 4h, Group 5). Do not feed ears/stalks to animals for 28 days. OMRI listed.

spinosad (SpinTor 2SC): 1.5 to 6 oz/A (1 dh, REI 4h, Group 5).

thiodicarb (Larvin* 3.2): 20 to 30 oz/A (0 dh, REI 48h, Group 1A). DO NOT feed silage to livestock.

zeta-cypermethrin (Mustang*): 3 to 4.3 oz/A (3 dh, REI 12h, Group 3A).

▼COMMON AND FALL ARMYWORM

The fall armyworm does not overwinter in New England. Infestations result from fertile moths carried northward on storm fronts from southern states from mid July into September. Flights are heavier near the coast, but move inland as well. The flights are sporadic and difficult to predict, and do not necessarily correspond with corn earworm flights, so monitoring with pheromone traps in whorl stage corn is very useful.

Moths (males) have mottled brown forewings with a slanting white bar across the wing, and plain light tan hindwings. They measure about three quarters of an inch long.

Female moths lay clusters of eggs on the leaves of a variety of host plants, preferring whorl stage corn to older corn. Eggs hatch in 2-10 days, depending upon temperature.

Caterpillars are smooth (unlike CEW) and dark green or brown with lengthwise stripes and dark spots. Full-grown larvae reach 1 1/2 inches. The head capsule is dark with a distinctive light colored marking in the form of an upside-down Y. (See photo identification section.)

Feeding damage from caterpillars occurs first in whorl stage corn, deep within the whorl, on leaves and in the newly forming green tassel. Watch whorl stage corn for ragged feeding damage and masses of sawdust-like excrement. Fall armyworm larvae eat into the side of corn ears, leaving behind frass and a large hole. They also feed in the tip, making a mess of the kernels. The most effective way to prevent ear damage is to apply controls during whorl and pretassel stage. If flights are very high, silk sprays may be needed.

Monitor fall armyworm moths with a bucket trap (eg Universal Moth Trap or Multiplier traps) with a lure (Scentry lure, PSU type) clipped under the lid and a vapor strip placed inside the trap. Hang the trap on a stake at plant height in whorl stage corn. Count moths at least weekly. Replace lure every two weeks. Replace vapor strip every 4-6 weeks.

Scout whorl and pretassel corn by checking 100 plants in groups of 10 or 20 in a V or X pattern across the field. Avoid checking only field edges, and start at random, not only where you can see damage. A plant is infested if at least one caterpillar is found. If feeding damage is old and no larva is found, the caterpillar may have left the plant to pupate in the soil. If 15% or more of plants are infested with FAW, a control is needed.

In emerging tassels, combine counts for ECB and FAW. For example, if 10% of plants have FAW and 12% have ECB, the combined infestation is 22%, above the 15% threshold.

Common armyworm, also known as armyworm or true armyworm, migrates from southern areas anytime from March to September. Eggs are laid on grasses and grains in preference to corn and other crops. Larvae feed at night and are grayish green with a broad stripe on each side and a yellow-brown head. Damage is similar to fall armyworm and is usually sporadic and not sufficient to require treatment. Outbreaks are not common in New England but may occur and cause significant damage.

Bacillus thuringiensis aizawai (XenTari): 1/2 to 2 lb/A (0 dh, REI 4h, Group 11). Use alone to control light populations of first and second instar larvae. Add a contact insecticide to control more mature larvae and higher populations. Follow manufacturer's directions. OMRI listed.

Bacillus thuringiensis kurstaki: (0 dh, Group 11). Used alone to control light populations of first and second instar larvae. Use higher rates. Can be tank mixed with other insecticides to control more mature larvae and higher populations. Follow manufacturer's directions. Many products OMRI listed (see Insect Management section).

bifenthrin (Capture* 2EC): 2.1 to 6.4 oz/A (1 dh, REI 12h, Group 3A). Use prohibited on corn in all coastal counties.

cyfluthrin (Baythroid* 2): 2.8 oz/A (0 dh, REI 12h, Group 3A). For fall armyworm first and second instar only.

deltamethrin (Decis* 1.5EC): 1.5 to 2.4 oz/A (1 dh, REI 12h, Group 3A).

esfenvalerate (Asana* XL): 5.8 to 9.6 oz/A (1 dh, REI 12h, Group 3A). For fall armyworm first and second instar only.

gamma-cyhalothrin (Proaxis*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A). For control of first and second instars only.

indoxacarb (Avaunt): 2.5 to 3.5 oz/A (3 dh, REI 12h for mechanically harvested and 14 days for hand harvested, Group 26). Whorl through tassel emergence (prior to silking) application only.

lambda-cyhalothrin (Warrior*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A). Use high rate for large larvae.

methomyl (Lannate SP*): 1/4 to 1/2 lb/A (0 dh for ears, 3 dh if used for feed or forage, REI 48h, Group 1A). Some sweet corn varieties may be damaged by methomyl. More severe damage may occur with the Lannate* LV formulation than with the Lannate* SP (Soluble Powder) formulation.

permethrin (Pounce*): 4 to 8 oz/A (1 dh, REI 12h, Group 3A)

spinosad (Entrust): 0.5 to 2 dry oz/A (1 dh, REI 4h, Group 5). Do not feed ears/stalks to animals for 28 days. OMRI listed.

spinosad (SpinTor 2SC): 1.5 to 6 oz/A (1 dh, REI 4h, Group 5). Conserves aphid predators.

thiodicarb (Larvin* 3.2): 20 to 30 oz/A (0 dh, REI 48h, Group 1A). DO NOT feed silage to livestock.

zeta-cypermethrin (Mustang*): 3 to 4.3 oz/A (3 dh, REI 12h, Group 3A).

▼CORN EARWORM (CEW)

Corn earworm (CEW) moths migrate annually into the Northeast, traveling north on storm fronts, and may arrive anytime from mid-July through September. Heaviest numbers are found in coastal areas and up the major river valleys. The severity of infestations varies from year to year and may change suddenly during the season.

Adult moths are light tan with a distinctive dark spot on each forewing, and a dark band near the margin of the hind wing, and a wingspan of 1.2-1.5 inches. Live moths have bright green eyes. Moths are active at night. Eggs are laid directly on fresh silk and hatch in 2.5 to 6 days — more quickly at higher temperatures (up to 90°F). Newly-hatched caterpillars crawl down the silk channel and feed on the kernels at the tip, leaving unsightly frass. In the tip they are protected from insecticide sprays. Sprays or other control measures must be timed to prevent larvae from entering the ear.

Corn earworm larvae may be brown, tan, green, or pink, with light and dark longitudinal stripes and reach 1 1/2 to 2 inches when full grown. The head capsule is plain golden brown, and small bumps and hairs give the body a rough texture.

Monitoring moth flight with pheromone traps is key to season-long control, both to respond quickly to changes in flight and to avoid unnecessary sprays. Reports of moth trap captures at selected locations are provided in most New England states. The most accurate and timely flight information will be obtained by monitoring your own fields. Heliothis net traps baited with Hercon Heliothis zea pheromone lures are commercially available and widely used in the region. Place traps in blocks with fresh silk and count moths twice weekly to monitor average nightly catch. Replace lures every two weeks.

Control depends upon maintaining insecticide coverage on the silks. Directed sprays to the ear zone provide the best coverage. Repeat applications to silk every three to six days depending on trap captures according to the chart below. If maximum daily temperature is below 85°F for 2-3 days, spray intervals may be extended by one day. Continue treatments until five to seven days before final harvest or until silk is completely dry and brown.

Spray Intervals for Corn Earworm

Moths/Night	Moths/Week	Spray Interval
0 - 0.2	0 - 1.4	no spray
0.2 - 0.5	1.4 - 3.5	6 days
0.5 - 1	3.5 - 7	5 days
1 - 13	7 - 91	4 days
Over 13	Over 91	3 days

See Reference 17 for more information on organic controls for corn earworm.

Bacillus thuringiensis aizawai (XenTari): 1/2 to 2 lb/A (0 dh, REI 4h, Group 11). Use alone to control light to moderate populations and add a contact insecticide to control moderate to heavy populations. Follow manufacturer's directions. OMRI listed.

Bacillus thuringiensis kurstaki: (0 dh, Group 11). Can be tank mixed with other insecticides. Follow manufacturer's directions. Many products OMRI listed (see Insect Management section).

bifenthrin (Capture* 2EC): 2.1 to 6.4 oz/A (1 dh, REI 12h, Group 3A). Use prohibited on corn in all coastal counties.

cyfluthrin (Baythroid* 2): 1.6 to 2.8 oz/A (0 dh, REI 12h, Group 3A).

deltamethrin (Decis* 1.5EC): 1.5 to 2.4 oz/A (1 dh, REI 12h, Group 3A).

esfenvalerate (Asana* XL): 5.8 to 9.6 oz/A (1 dh, REI 12h, Group 3A).

gamma-cyhalothrin (Proaxis*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

lambda-cyhalothrin (Warrior*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

methomyl (Lannate SP*): 1/4 to 1/2 lb/A (0 dh for ears, 3 dh if used for feed or forage, REI 48h, Group A). Some corn varieties may be damaged by methomyl. More severe damage may occur with the Lannate* LV formulation than with the Lannate* SP (Soluble Powder) formulation. May not provide effective control under high corn earworm pressure.

permethrin (Pounce*): 4 to 8 oz/A (1 dh, REI 12h, Group 3A).

soybean oil (Golden Pest Spray Oil): 0.5 ml applied by hand directly to silk within 7 days after 50% of the ears are silking (REI 4h, Group 25). Apply at least 5 days after silk initiation to avoid tip injury, and before 6 to 7 days after silk initiation to gain optimum control. Mix with *Bacillus thuringiensis* (or spinosad) for improved control. One application per field. Commercial oil applicators (i.e., Zea-later) are available. OMRI listed.

spinosad (Entrust): 1 to 2 dry oz/A (1 dh, REI 4h, Group 5). Do not feed ears/stalks to animals for 28 days. Effective for low CEW pressure. Switch to another product when CEW pressure is high (13 or more moths/night in pheromone trap) or when a 3-day spray schedule is warranted. OMRI listed.

spinosad (SpinTor 2SC): 3 to 6 oz/A (1 dh, REI 4h, Group 5). Effective for low CEW pressure. Switch to another product when CEW pressure is high (13 or more moths/night in pheromone trap) or when a 3-day spray schedule is warranted.

thiodicarb (Larvin* 3.2): 20 to 30 oz/A (0 dh, REI 48h, Group 1A). DO NOT feed silage to livestock.

zeta-cypermethrin (Mustang*): 3 to 4.3 oz/A (3 dh, REI 12h, Group 3A).

▼CORN FLEA BEETLES

These beetles transmit the bacterium that causes Stewart's wilt disease and are most troublesome after a mild winter. Start applications when plants are in the spike stage if

beetles are present and causing damage. Apply three to four treatments every four to five days. Spunbonded row covers can protect plants against this pest. Some varieties are more tolerant to Stewart's Wilt (see Sweet Corn Varieties Section on page 102).

bifenthrin (Capture* 2 EC): 2.1 to 6.4 oz/A (1 dh, REI 12h, Group 3A). Use prohibited on corn in all coastal counties.

carbaryl (Sevin XLR Plus): 1 to 2 qt/A (2 dh, REI 12h, 1A). Highly toxic to bees; should be applied in the evening.

chlorpyrifos (Lorsban 75WG): 1.33 lb/A (35 dh, REI 24h, Group 1B). Apply in 9 to 12 inch wide band over the row before corn is 6 inches tall.

cyfluthrin (Baythroid*2): 0.8 to 1.6 oz/A (0 dh, REI 12h, Group 3A).

deltamethrin (Decis* 1.5EC): 1 to 1.5 oz/A (1 dh, REI 12h, Group 3A).

esfenvalerate (Asana* XL): 5.8 to 9.6 oz/A (1 dh, REI 12h, Group 3A).

gamma-cyhalothrin (Proaxis*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

lambda-cyhalothrin (Warrior*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

methomyl (Lannate SP*): 1/4 to 1/2 lb/A (0 dh for ears, 3 dh if used for feed or forage, REI 48h, Group 1A). See ECB section for phytotoxicity warning.

permethrin (Pounce*): 4 to 8 oz/A (1 dh, REI 12h, Group 3A).

phorate (Thimet* 20G): 4.5 to 6 oz/1,000 row feet in a 7" band over the row at planting and lightly incorporate (30 dh, REI 48h, Group 1B). DO NOT use in furrow. See label restrictions.

terbufos (Counter* 15G): 6 to 8 oz/1,000 row feet for any row spacing (REI 48h, Group 1B). Place granules in seed furrow behind planter shoe or in a 7" band, and lightly incorporate.

thiamethoxam (Cruiser 5FS): 1.28 to 5.1 oz/100 lb of seed (REI 12h Group 4). Systemic seed treatment. For early season protection from flea beetles.

zeta-cypermethrin (Mustang*): 2.4 to 4.3 oz/A (3 dh, REI 12h, Group 3A).

▼CORN LEAF APHID

The corn leaf aphid (CLA) is blue-green or black, with black legs. These aphids overwinter as females on grass weeds and cereals, particularly barley. Females produce live young which mature in as little as 6 days. There are up to 9 generations per year. CLAs first colonize whorl leaves and the immature tassel. Populations may become numerous enough to interfere with pollen shed and to stunt plants. Maize dwarf mosaic virus may be spread by the corn leaf aphid, though the most important vector for this disease is the green peach aphid. The presence of high aphid populations or honey dew on corn ears can render the ears unmarketable. Honey dew on ears may increase the number of CEW moths attracted to the plants. Monitor for aphids while scouting pre-tassel stage corn for ECB or FAW

in late July or August. Pre-tassel stage sprays may be needed in dry seasons when 50% of the plants are infested. Sweet corn plantings that are seeded before 10 June are not bothered by corn leaf aphids. Varieties with purple or green tassels seem to be less susceptible to aphid build-up than those with yellow tassels. Ample rainfall or irrigation during the silk stage can reduce or eliminate aphid damage. Natural enemies reduce aphid numbers, but may not provide adequate control, especially in dry seasons. Whenever possible, conserve predators and parasites by using selective insecticides to control caterpillars before silking.

bifenthrin (Capture* 2EC): 2.1 to 6.4 oz/A (1 dh, REI 12h, Group 3A). Use prohibited on corn in all coastal counties.

deltamethrin (Decis* 1.5EC): 1.5 to 2.4 oz/A (1 dh, REI 12h, Group 3A). Suppression only.

endosulfan (Thionex* 50W): 2 lb/A (1 dh, REI 24h, Group 2A). Use for fresh corn only, not on corn for processing or for livestock feed.

esfenvalerate (Asana* XL): 5.8 to 9.6 oz/A (1 dh, REI 12h, Group 3A).

gamma-cyhalothrin (Proaxis*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A). Suppression only.

lambda-cyhalothrin (Warrior*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A). Suppression only.

methomyl (Lannate SP*): 1/4 to 1/2 lb/A (0 for ears, 3 dh if used for forage, REI 48h, Group 1A). See ECB section for phytotoxicity warning.

▼CUTWORMS

Black cutworm is the most common of the many cutworm species that damage corn in New England. Adults are night-flying tan and black moths, while the caterpillars are dark-grey to black and up to 2" in length. Moths from the South arrive between March and June. Eggs are laid mostly on grasses and winter annual weeds, usually near areas of the field prone to flooding. Certain fields tend to have a history of repeated cutworm damage. The larvae feed after dark while hiding under the soil surface during the day. There are 2 to 3 generations per year but usually only the first generation, which produces larvae in May and June, damages corn. Small larvae feed on leaves and occasionally larger larvae cut seedlings off near the soil line. Adults can be monitored with a yellow and white Unitrap from March through May. A catch of over 40 moths before June indicates that frequent spring and early summer scouting is prudent. Scout problem fields weekly, checking at least 100 plants for leaf feeding and cut stems, especially near field margins. Spot spray heavily hit areas or edges of the field if 5% of the plants have been cut down. For best results, make application between midnight and dawn while cutworms are feeding aboveground. Foliar-applied rescue treatments are recommended over preventative soil-applied insecticides. Ground beetles, parasitic flies and wasps and other general predators help reduce populations. When corn follows sod/hay in rotation, fall-plowing may lower cutworm populations by reducing spring egg-laying sites. Weedy and reduced-till fields tend to suffer the most damage.

Bacillus thuringiensis kurstaki: (0 dh, Group 11). Can be tank mixed with other insecticides. Follow manufacturer's directions. Many products OMRI listed (see *Bacillus thuringiensis*-based Bioinsecticides for Major Vegetable Crops, Table 21, page 49).

bifenthrin (Capture* 2EC): 2.1 to 6.4 oz/A (1 dh, REI 12h, Group 3A). Use prohibited on corn in all coastal counties.

carbaryl (Sevin XLR Plus): 2 qt/A (2 dh, REI 12h, Group 1A).

chlorpyrifos (Lorsban 75WG): 1.33 to 2.67 lb/A (35 dh, REI 24h, Group 1B). Broadcast and incorporate into top 2" to 4" of soil. Post-emergence apply 0.67 to 1.33 lb/A to moist soil at night when cutworms are active. Post-emergence spray may be more effective than broadcast.

cyfluthrin (Baythroid* 2): 0.8 to 1.6 oz/A (0 dh, REI 12h, Group 3A).

deltamethrin (Decis* 1.5EC): 1 to 1.5 oz/A (1 dh, REI 12h, Group 3A).

esfenvalerate (Asana* XL): 5.8 to 9.6 oz/A (1 dh, REI 12h, Group 3A).

ethoprop (Mocap* 15%G): 8 oz/1,000 row feet (REI 48h, Group 1B). Apply as 6 to 7" band over closed seed furrow, then incorporate into top 1/2" of soil.

gamma-cyhalothrin (Proaxis*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

lambda-cyhalothrin (Warrior*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

permethrin (Pounce*): 4 to 8 oz/A (1 dh, REI 12h, Group 3A).

tefluthrin (Force* 3G): 4 to 5 oz/1,000 row feet (REI 0h, Group 3A). Place granules in furrow or in a 7" band directly behind planter shoe.

thiamethoxam (Cruiser 5FS): 1.28 to 5.1 oz/100 lb of seed (REI 12h, Group 4). Systemic seed treatment.

thiodicarb (Larvin* 3.2): 20 to 30 oz/A (0 dh, REI 48h, Group 1A).

zeta-cypermethrin (Mustang*): 2.4 to 4.3 oz/A (3 dh, REI 12h, Group 3A).

▼SEEDCORN MAGGOT

Soils that are high in decaying manure or vegetable matter, especially in cool wet springs, attract the egg-laying female flies. If using animal or green manure, treat with:

bifenthrin (Capture* 2EC): 3.9 to 5.1 oz/A (30 dh, REI 12h, Group 3A). In-furrow or T-band treatment. Use prohibited on corn in all coastal counties.

chlorpyrifos (Lorsban 75WG): 2.67 lb/A (35 dh, REI 24h, Group 1B). Broadcast and incorporate into top 2" to 4" of soil.

gamma-cyhalothrin (Proaxis*): 0.66 fl oz/1,000 row feet (21 dh, REI 24h, Group 3A). Band or in-furrow applications.

lambda-cyhalothrin (Warrior*): 0.2 oz/1,000 row feet (21 dh, REI 24h, Group 3A). Not for use in NH. Band or in-furrow application.

phorate (Thimet* 20-G): 4.5 to 6 oz/1,000 row feet in a 7" band over the row at planting and lightly incorporate (30 dh, REI 48h, Group 1B). DO NO use in furrow. See label restrictions.

tefluthrin (Force* 3G): 4 to 5 oz/1,000 row feet (REI 0h, Group 3A). Place granules in furrow or in a 7" band directly behind planter shoe.

terbufos (Counter* 15G): 6 to 8 oz/1,000 row feet, banded or in furrow at planting (REI 48h, Group 1B).

thiamethoxam (Cruiser 5FS): 1.28 to 5.1 fl oz/100 lb of seed (REI 12h, Group 4). Systemic seed treatment. For early-season protection from seedcorn maggot.

▼WIREWORMS

To avoid wireworm problems, corn should not be grown in rotation with sod or grass crops. Delay planting susceptible crops, such as corn or potatoes, on such land for at least two years after the sod has been broken. Summer fallow is recommended for at least one season.

bifenthrin (Capture* 2EC): 0.15 to 0.3 oz/1,000 row feet (30 dh, REI 12h, Group 3A). See instructions for application at planting. Use prohibited on corn in all coastal counties.

chlorpyrifos (Lorsban 75WG): 2.67 lb/A (35 dh, REI 24h, Group 1B). Broadcast and incorporate into top 2" to 4" of soil.

ethoprop (Mocap* 15%G): 8 oz/1,000 row feet (REI 48h, Group 1B). Apply as 6 to 7" band over closed seed furrow, then incorporate into top 1/2" of soil.

gamma-cyhalothrin (Proaxis*): 0.66 oz/1,000 row feet (21 dh, REI 24h, Group 3A). Band or in-furrow applications. Suppression only.

lambda-cyhalothrin (Warrior*): 0.1 oz/1,000 row feet (21 dh, REI 24h, Group 3A). Not for use in NH. Band or in-furrow application.

phorate (Thimet* 20-G): 4.5 to 6 oz/1,000 row feet in a 7" band over the row at planting and lightly incorporate (30 dh, REI 48h, Group 1B). Do not use in furrow. See label restrictions.

tefluthrin (Force* 3G): 5 oz/1,000 row feet placed in the seed furrow. (REI 0h, Group 3A).

terbufos (Counter* 15G): 6 to 8 oz/1,000 row feet, banded or in furrow at planting (REI 48h, Group 1B).

thiamethoxam (Cruiser 5FS): 1.28 to 5.1 fl oz/100 lb of seed (REI 12h, Group 4). Systemic seed treatment. For early-season protection from wireworms.

▼TWO-SPOTTED SPIDER MITE

Outbreaks are often caused by the use of broad-spectrum insecticides. Two-spotted spider mites (TSSM) tend to be prone to pesticide resistance. For more information on TSSM see the Eggplant section.

bifenthrin (Capture* 2EC): 5.1 to 6.4 oz/A (1 dh, REI 12h, Group 3A). Use prohibited on corn in all coastal counties.

oxydemeton-methyl (MSR*): 1 1/2 to 2 pt/A (7 dh, REI 48h, Group 1B). If using more than one application per season, dh is 21 days.

▼JAPANESE BEETLE

These beetles feed on corn silk, but are usually controlled by sprays directed at controlling ECB and corn earworm.

bifenthrin (Capture* 2EC): 2.1 to 6.4 oz/A (1 dh, REI 12h, Group 3A). Use prohibited on corn in all coastal counties.

carbaryl (Sevin XLR Plus): 1 to 2 qt/A (2 dh, REI 12h, Group 1A). Highly toxic to bees; apply in the evening.

cyfluthrin (Baythroid* 2E): 1.6 to 2.8 oz/A (0 dh, REI 12h, Group 3A).

deltamethrin (Decis* 1.5EC): 1.5 to 2.4 oz/A (1 dh, REI 12h, Group 3A).

gamma-cyhalothrin (Proaxis*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

lambda-cyhalothrin (Warrior*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

pyrethrins + piperonyl butoxide (Pyrenone): 1 tsp/gal, or 1 to 12 oz/A (0 dh, REI 12h, Group 3A).

zeta-cypermethrin (Mustang*): 2.4 to 4.3 oz/A (3 dh, REI 12h, Group 3A).

▼STALK BORER

The eggs of this pest overwinter on grassy weeds. Upon hatching in the spring, the borers feed on grasses. When the larvae become too large to feed within the grass, they migrate into corn fields, attacking border rows.

Eliminate grassy weeds in August by mowing or use of herbicides. Scout for injury soon after the corn emerges in the spring and treat infested corn as needed. Apply insecticides to outer rows at the first sign of damage by this pest.

bifenthrin (Capture* 2EC): 2.1 to 6.4 oz/A (1 dh, REI 12h, Group 3A). Use prohibited on corn in all coastal counties.

cyfluthrin (Baythroid* 2): 1.6 to 2.8 oz/A (0 dh, REI 12h, Group 3A).

deltamethrin (Decis* 1.5EC): 1.5 to 2.4 oz/A (1 dh, REI 12h, Group 3A).

esfenvalerate (Asana* XL): 5.8 to 9.6 oz/A (1 dh, REI 12h, Group 3A). Application must be made as soon as larvae migrate from grassy areas to corn, and before borers enter plants. More than one application may be necessary.

gamma-cyhalothrin (Proaxis*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

lambda-cyhalothrin (Warrior*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

permethrin (Pounce* 3.2EC): 4 to 8 oz/A (1 dh, REI 12h, Group 3A).

▼SAP AND PICNIC BEETLES

Adult beetles are 3/16" long and are black, or black with orange spots. The adult beetles survive the winter under plant debris along hedgerows or in fields. Eggs may be deposited in rotting fruit and on silk or in kernels at the tip of the ear. Larvae resemble tiny worms or thin maggots. Populations build when attracted to decomposing fruit,

cull piles, or corn ears injured by birds or caterpillars. Ears with exposed tips, especially super sweet and *Bt* varieties, are susceptible to infestation. To prevent or reduce damage, select varieties that have good tip cover, use clean cultivation, control ear-infesting caterpillars and remove or bury decomposing fruit on a regular basis. Insecticides will not completely control heavy infestations.

bifenthrin (Capture* 2EC): 2.1 to 6.4 oz/A (1 dh, REI 12h, Group 3A). Use prohibited on corn in all coastal counties.

carbaryl (Sevin XLR Plus): 1 to 2 qt/A (2 dh, REI 12h, Group 1A). DO NOT apply to corn that is still shedding pollen. Toxic to bees.

esfenvalerate (Asana* XL): 5.8 to 9.6 oz/A (1 dh, REI 12h, Group 3A).

gamma-cyhalothrin (Proaxis*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

lambda-cyhalothrin (Warrior*): 2.5 to 3.8 oz/A (1 dh, REI 24h, Group 3A).

malathion (Malathion 57 EC): 1 1/2 pt/A (5 dh, REI 12h, Group 1B).

methomyl (Lannate*SP): 1/4 to 1/2 lb/A (0 dh for ears, 3 dh if used for forage, REI 48h, Group 1A). See ECB section for phytotoxicity warning.

pyrethrins + piperonyl butoxide (Pyrenone): 1 tsp/gal, or 1 to 12 oz/A (0 dh, REI 12h, Group 3A).

zeta-cypermethrin (Mustang*): 2.4 to 4.3 oz/A (3 dh, REI 12h, Group 3A).

▼WHITE GRUB

bifenthrin (Capture* 1.15G): 3.2 to 8 oz/1,000 row ft (1 dh, REI 12h, Group 3A). In-furrow application. Use prohibited on corn in all coastal counties.

chlorpyrifos (Lorsban 75WG): 2.67 lb/A (35 dh, REI 24h, Group 1B). Broadcast and incorporate into top 2" to 4" of soil.

ethoprop (Mocap* 15%G): 8 oz/1,000 row feet (REI 48h, Group 1B). Apply as 6 to 7" band over closed seed furrow, then incorporate into top 1/2" of soil. Suppression only.

gamma-cyhalothrin (Proaxis*): 0.66 oz/1,000 row feet (21 dh, REI 24h, Group 3A). Band or in-furrow applications.

lambda-cyhalothrin (Warrior*): 0.25 to 0.45 oz/1,000 row feet. Not for use in NH. Band or in-furrow application.

phorate (Thimet* 20-G): 4.5 to 6 oz/1,000 row feet in a 7" band over the row at planting and lightly incorporate (30 dh, REI 48h, Group 1B). DO NOT use in furrow. See label restrictions.

tefluthrin (Force* 3G): 5 oz/1,000 row feet (REI 0h, Group 3A). Place granules in seed furrow.

terbufos (Counter* 15G): 6 to 8 oz/1,000 row feet, banded or in furrow at planting (REI 48h, Group 1B).

thiamethoxam (Cruiser 5FS): 1.28 to 5.1 fl oz/100 lb of seed (REI 12h, Group 4). Systemic seed treatment. For early-season protection from white grubs.

DISEASE CONTROL

▼ MAIZE DWARF MOSAIC VIRUS (MDMV)

There are several strains of MDMV which are spread by more than 20 species of aphids. The virus can be seedborne in maize and probably in some annual grasses. The virus is nonpersistent but is retained by the aphid for up to 18 hours. This allows time for the vector to be transported from southern states where MDMV is more prevalent and many weed hosts occur. Johnson grass is an important perennial weed host for MDMV occurring in southern New England and it should be eradicated. Plant resistant or tolerant corn varieties. Golden Gleam, Sundance, Spring Gold, Seneca Star, Early Fortune, Sugar Loaf, Dandy and Capitan have some tolerance. Enforcer, Biguard, Silver Red and Seneca 258 are resistant. MDMV is more likely to be a problem for later plantings. Plant late plantings away from peach trees, overwintering host of the green peach aphid.

▼ RUST (*PUCCINIA*)

The common rust fungus that occurs on sweet corn does not overwinter in the Northeastern United States; each year it is blown up from the south. Rust can cause significant reduction in ear weight and yield on susceptible varieties. Corn is more susceptible to infection prior to tasseling so later maturing plantings may have higher losses. Fungicides will control this disease but should be applied before tasseling. Apply fungicides when 80% of the plants show one or more pustule per leaf. Resistant varieties are available.

chlorothalonil (Bravo Ultrex 82 WDG): 0.7 to 1.8 lb/A. Apply when thresholds are reached (14 dh, REI 12h, Group M5). Reapply at 7-day intervals. Do not apply to sweet corn to be processed.

maneb/mancozeb (Maneb, Penncozeb, Manzate, Dithane): Rates vary depending on the formulation. See label and Table 23, page 55. (7 dh, REI 24h, Group M3)

propiconazole (Tilt): Apply 4 fl oz/A at the first sign of rust pustules and repeat at 7- to 14-day intervals (14 dh REI 24h, Group 3). Do not apply after silking and so not apply more than 16 fl oz/crop.

azoxystrobin & propiconazole (Quilt): 10.5 to 14 fl oz/A. (14 dh, REI 24h, Groups 3 & 11). Apply when disease first appears. If favorable conditions for disease persist, continue to apply on a 14 day schedule. Alternate with another product with different mode of action (Group#).

▼ SEED DECAY

Buy treated seed. Do not use treated seed for food, feed or oil purposes.

▼ STEWART'S WILT (*PANTOAE [ERWINIA] STEWARTII*)

This bacterial disease is spread by the corn flea beetle and is particularly damaging when susceptible varieties are planted following mild winters. *P. stewartii* overwinters in the alimentary tract of adult corn fleas beetles, not in the soil or in plant debris. Severity of Stewart's Wilt depends on three factors: 1) the winter temperatures prior to planting 2) the amount of disease the previous season and 3) cultivar susceptibility. If cold winter temperatures occur, fewer flea beetles survive to transmit the disease. The amount of

disease in the previous season determines the percentage of emerging beetles carrying the bacterium. Hybrids with greater levels of resistance can tolerate more infection with less yield loss. Resistance restricts the movement of the bacteria in the plant. Grow varieties that are resistant to the disease. Information on cultivar susceptibility is available online at <http://www.sweetcorn.uiuf.edu/stewarts>. Use insecticides to control flea beetles, particularly on susceptible varieties in the seedling stage. This is not as effective as resistant varieties, but reduces losses where susceptible hybrids must be planted. Scout frequently for flea beetles as rapid growth of leaf tissue makes untreated surfaces available.

▼ COMMON SMUT (*USTILAGO MAYDIS*)

Smut occurs sporadically from one season to another but usually less than 2% of the plants are affected. The disease is favored by dry conditions when temperatures are between 80°F to 90°F and nitrogen fertility is high. Injury due to cultivation, hail or wind-blown sand can increase the incidence of disease when environmental conditions are favorable. Fungicides will not provide effective control of common smut.

CORN, ORNAMENTAL AND POPCORN

Ornamental corn is a flint type corn that was grown for food by the Indians of both North and South America. Today it is grown for ornamental purposes. Ornamental corn will grow in any sunny, well-drained, fertilized soil that will grow field or sweet corn. Adequate moisture, especially after the ears form, is necessary. Isolation is suggested. Bird damage can be a concern. Use fertilizer recommendations for sweet corn.

■ Varieties

Miniature	Regular	Popcorn
Carousel	Fiesta	Strawberry Corn
Little Jewels	Rainbow	White Cloud

Hybrids are available, but most of the ornamental corn is open pollinated. Seed can be saved if it is not grown near sweet corn. Ornamental popcorn should be considered for miniature decorative ears and the dual purpose of popping.

■ Spacing and Seeding

Because of its hard seed coat, ornamental corn should be planted early to allow for full maturity on the stalks. Plant to 9 to 10" within rows and 30 to 36" between rows at 1 to 1-1/2" deep. Keep ornamental corn away from sweet corn or popcorn that pollinates at the same time as ornamental corn.

■ Lime and Fertilizer

See sweet corn lime and fertilizer recommendations page 101.

■ Harvest

Harvest when the kernels are hard and bright and the husks are brown. Husk and hang to dry.