

# Chapter 21.

## Sweet Corn Production in Florida

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### BOTANY

#### Nomenclature

**Family** - Poaceae (Gramineae)

**Sweet corn** - *Zea mays* var. *rugosa*

#### Origin

Like bean, potato, tomato, pepper, and pumpkin, sweet corn is of New World origin (Fig. 21-1). However, wild corns have not been found. It is believed that corn which evolved from ancestral types in South America was later domesticated in Central America.

#### Related Species

Sweet and popcorn are the only members of the Poaceae family which are classed as vegetables. Nonetheless, this family is one of the most important in providing human sustenance, either directly or as feed for domestic animals, with grains such as wheat, rice, oats, rye, and corn or indirectly as hay and forage grasses for domestic animals. Sugar cane is also an important member of this family.

### VARIETIES

A description of major sweet corn types currently available is given in Table 1. Supersweet (shrunken-2) sweet corn varieties that are in commercial use in Florida are given in Table 2.

**Table 1.** Description of major sweet corn types currently available.

Type	Genes controlling sweetness	Storage life <sup>1</sup> (days)	Relative sugar content
Sugary	Full complement of sugary	1 to 3	Normal
Sugary Enhanced, also "Modified" and "EH"	Full complement of sugary (su) and half or full complement of sugary enhancer (se)	3 to 5	Slight to moderate or even high levels
Supersweet, also "Ultra," "Extra" sweet	No sugary (su); full complement of shrunken-2 (sh <sub>2</sub> )	5 to 10	High
Synergistic, also "Sweet-Gene Hybrid"	Full complement of sugary (su); and half complement of shrunken-2 (sh <sub>2</sub> )	3 to 5	Moderate
Improved Supersweet	Half complement of sugary (su); and full complement of shrunken-2 (sh <sub>2</sub> )	5 to 10	Very high
ADX	No sugary (su) or shrunken-2 (sh <sub>2</sub> ) genes; full complement of ae, du, and wx genes.	5 to 10	Moderate to high

<sup>1</sup> These values are approximations provided for comparison among types. Actual storage time will depend on variety, cultural practices, and postharvest handling methods.

### Pollination

Sweet corn is wind pollinated, i.e. wind is the agent responsible for transfer of pollen from the tassel to the silk to effect the pollination process. Isolation of genetic types, just as isolation of yellow and white corns of a single genetic type, must occur for them to produce their desired characteristics. Isolation strategies include:

**Distance** - about 300 feet should be sufficient isolation to avoid cross pollination.

**Time** - Maturity differences of at least 14 days which can be accomplished by variety selection or successive plantings should be sufficient to avoid cross pollination of genetic types.

### SEEDING AND PLANTING

Planting dates and seeding information are given in Table 3.

### FERTILIZER AND LIME

For mineral soils with subsurface or sprinkler irrigation, band all P<sub>2</sub>O<sub>5</sub> and micronutrients with 20 to 25% of N and K<sub>2</sub>O at planting. Sidedress band remaining N and K<sub>2</sub>O in one or two applications during the early part of growth cycle. After midseason, N and K<sub>2</sub>O can be applied through center-pivot irrigation system at rates of 10 to 20 lbs/A of N and K<sub>2</sub>O in several applications.

For mulched crops with subsurface irrigation, broadcast all P<sub>2</sub>O<sub>5</sub>, micronutrients and 20 to 25% N and K<sub>2</sub>O in bed prior to mulching. For subsurface irrigated crops, band remaining N and K<sub>2</sub>O in groove 2 to 3 inches deep in bed center. For sprinkler irrigation, broadcast all fertilizer in bed.

For organic soils, band all P<sub>2</sub>O<sub>5</sub> and micronutrients at planting. Broadcast all K<sub>2</sub>O. Supplemental N at rate of 40 lbs/A might be needed in cool winter weather or after leaching rain.

Soil test and fertilizer recommendations for mineral soils are given in Table 4. Soil test and fertilizer recommendations for Histosols are given in Table 5.

### PLANT TISSUE ANALYSIS

Plant tissue analysis information for sweet corn is given in Table 6. The analysis was done when the plants were 30 inches tall, using the most recently matured leaf.

### IRRIGATION

Water requirements of sweet corn (see Chapter 3, *Principles and Practices for Irrigation Management of Vegetables*, Table 4 to 6) increase rapidly from about 40% of ETo during early growth to 110% of ETo at peak growth (see Chapter 3, *Principles and Practices for Irrigation Management of Vegetables*, Table 3). Proper water management is essential during the silking and tasseling and the

ear development periods. Water requirements may decrease to 100% of ETo during the final week or two of growth.

### WEED MANAGEMENT

Herbicides labeled for weed control in sweet corn are listed in Table 7.

### DISEASE MANAGEMENT

Chemicals approved for disease management in sweet corn are listed in Table 8.

### INSECT MANAGEMENT

Table 9 outlines the insecticides approved for use on insects attacking sweet corn.

### PRODUCTION COSTS

Average breakeven production costs for sweet corn vary among Florida's production areas. The costs for are outlined for Dade County in Table 10 and Palm Beach County in Table 11.

**Table 3.** Seeding and planting information for sweet corn.

Planting dates	
North Florida	Feb - Apr
Central Florida	Jan - Apr
South Florida	Oct - Mar
Seeding information	
Distance between rows (in)	28 - 32
Distance between plants (in)	6 - 8 <sup>1</sup>
Seeding depth (in)	1.0 - 1.5
Seed per acre (lb)	6 - 15
Days to maturity from seed	64 - 90
Plant population (acre)	24,000 - 32,000
<sup>1</sup> Wider rows and between plant spacings will yield larger ears.	

**Table 2.** Some supersweet (shrunken-2) sweet corn varieties that are grown in Florida arranged by kernel color.

Yellow	White	Bicolor
Beyond Multisweet	Boreal	Big Time
Prime Time	Summer Sweet 6801	Beyond BC
Prime Plus	Summer Sweet 7111	Fantastic
Summer Sweet 6800R	Summer Sweet 7311	Obsession
Summer Sweet 7100R	Vail	Summer Sweet 6802
Summer Sweet 7650R		Summer Sweet 7102
Summer Sweet 8100R		Summer Sweet 8102R
Winstar		Tethys

**Table 4.** Soil test and fertilizer recommendations for mineral soils for sweet corn.<sup>1</sup>

Target pH	N lb/A <sup>2</sup>	$P_2O_5$ <sup>2</sup>					$K_2O$				
		VL	L	M	H	VH	VL	L	M	H	VH
(lb/A/crop season)											
6.5	200	150	120	100	0	0	150	120	100	0	0

<sup>1</sup> See Chapter 2 section on supplemental fertilizer application and best management practices, pg 11.

<sup>2</sup> Seeds and transplants may benefit from applications of a starter solution at a rate no greater than 10 to 15 lbs/acre for N and  $P_2O_5$ , and applied through the plant hole or near the seeds.

**Table 5.** Soil test and fertilizer recommendations for Histosol soils for sweet corn, with target pH = 6.5 and N rate 0 lb/A.

P and K index and fertilizer rate <sup>1</sup>						
P index	3	6	9	12	15	18
$P_2O_5$ (lb/A)	160	120	80	40	0	0
K index	50	80	110	140		
$K_2O$ (lb/A)	120	60	0	0		

<sup>1</sup> Seeds and transplants may benefit from applications of a starter solution at a rate no greater than 10 to 15 lbs/acre for N and  $P_2O_5$ , and applied through the plant hole or near the seeds.

**Table 6.** Plant tissue analysis for sweet corn plants 30 inches tall. Dry wt. basis.

Status	N	P	K	Ca	Mg	S	Fe	Mn	Zn	B	Cu	Mo
	Percent						Parts per million					
Deficient	<2.5	0.2	2.5	0.5	0.2	0.2	40	40	25	10	4	0.1
Adequate range	2.5-4.0	0.2-0.4	2.5-4.0	0.5-0.8	0.2-0.4	0.2-0.4	40-100	40-100	25-40	10-30	4-10	0.1-0.2
High	>4.0	0.4	4.0	0.8	0.4	0.4	100	100	40	30	10	0.2
Toxic (>)									100			

**Table 7.** Chemical weed controls: sweet corn.

Herbicide	Labeled crops	Time of application to crop	Rate (lbs. AI./Acre)	
			Mineral	Muck
Atrazine (AAtrex 4L) (AAtrex Nine-0)	Sweet corn	Preemergence	1.0 - 2.0	2.0 - 3.0
<b>Remarks:</b> Controls germinating annuals. Apply to moist soil. Note label precautions of planting non-registered or sensitive crops for at least one growing season.				
Atrazine (AAtrex 4L) (AAtrex Nine-0)	Sweet corn	Postemergence	1.0 - 2.8	1.0 - 2.8
<b>Remarks:</b> Controls emerged weeds. Apply in a minimum of 10 gals. of water before weeds are 1.5 inches tall. Use lower rates when weeds are small. Note replanting precautions listed above.				
Atrazine + Oil	Sweet corn	Postemergence	1.0 - 2.0 + oil	1.0 - 2.0 + oil
<b>Remarks:</b> Controls emerged weeds. Apply to small test plots to evaluate tolerance of new hybrid corn varieties. Following mixing instructions listed on the label and rates of emulsifiable oil or oil concentrate depending on ground or aerial application methods. Apply before annual grasses are 1.5" and broadleaf weeds are 4". Note replanting precautions. Do not apply to breeding stock or inbred lines of sweet corn.				
Bentazon (Basagran)	Corn (all types)	Postemergence	0.75 - 1.0	0.75 - 1.0
<b>Remarks:</b> Controls actively growing young broadleaf weeds. Recommended for burn down of annual morning glory and yellow nutsedge in corn. Consult label for weeds controlled/weed size table. Corn is tolerant at all stages of growth. Do not apply over 2 lbs ai (4 pts.)/acre per season. Add a crop oil concentrate (coc) at 2 pts/acre maximum.				

Table 7. Continued.

Herbicide	Labeled crops	Time of application to crop	Rate (lbs. AI./Acre)	
			Mineral	Muck
Carfentrazone (Aim)	Corn (all)	Preplant, Preemergence, Postemergence	0.008-0.016	0.008-0.016
<b>Remarks:</b> Controls young actively growing broadleaf weeds. May be applied 30 days before planting until corn reaches the 8 leaf collar growth stage. Rate is 0.5 fl oz product per acre. Use a nonionic surfactant in the spray mix. Leaf burn or speckling has been seen on older plants when applied over the top. Directed sprays are much safer. No yield reduction was seen in trials when leaf damage occurred. FMC states that the use is the responsibility of grower due to not being tested on all sweet corn varieties.				
EPTC (Eradicane 6.7E)	Sweet corn	Preplant incorporate	4.0 - 6.0	
<b>Remarks:</b> Use lower rate in light textured soil (sands). Must be incorporated into soil to prevent loss of herbicide. Thorough mixing is necessary especially in the control of rhizomes of Bermuda grass and yellow and purple nutsedge.				
Glyphosate (Roundup, Durango Touchdown, Glyphomax)	Sweet Corn	Chemical fallow Preplant, pre emergence, Pre transplant	0.3 - 1.0	
<b>Remarks:</b> Roundup, Glyphomax and Touchdown have several formulations. Check the label of each for specific labeling directions.				
Halosulfuron (Sempra) (Sanda)	Sweet Corn	Postemergence	0.032	0.032
<b>Remarks:</b> Sempra may be applied over-the-top or with drop nozzles from the spike to the layby stage of corn. Applications of $\frac{2}{3}$ oz by weight (.032 lb ai) per acre broadcast may be made with a sequential treatment of $\frac{2}{3}$ oz by wt directed or semi-directed to avoid application into the whorl may be made. Avoid cultivation for 7 days after application. Excellent control of nutsedges and active on cocklebur, pigweeds, ragweed and smartweed. Will not control emerged grasses. Consult label for plantback restrictions.				
Mesotrione (Callisto)	Sweet Corn	Pre emergence Postemergence	0.188-0.24 0.094	-
<b>Remarks:</b> Apply Callisto preemergence at 6.0 to 7.7 fl oz/ A. May be tank mixed with a grass herbicide for grass control. Apply at 3 fl oz/A postemergence. It may be tank mixed with herbicides such as atrazine, metolachlor, bentazone, etc. Check the label. Do not apply with a crop oil concentrate (coc), UAN, or AMS postemergence. Corn may be treated up to 30 inches tall. Do not harvest within 45 days after application. In some cultivars, transitory bleaching may occur. In trials, yield has not been affected.				
S-Metolachlor (Dual Magnum) (Dual II Magnum)	Sweet Corn	Pre emergence	1.0-1.5	
<b>Remarks:</b> Provides good control of annual grasses and certain broadleaf weeds. Use the lower rate on light sandy soils. Use higher rate on soils with organic matter 3% and greater. May be used as preemergence up to 4 pints (lbs/ai) on soils with 6 to 20% organic matter. May be used as directed spray to the base of corn plants 5 inches tall until corn plants reach 40 inches in height. See Special Local Needs (24c) label for muck soils.				
Paraquat (Gramoxone Inteon) (Firestorm)	Sweet Corn	Pre emergence	0.56 - 0.94	0.56 - 0.94
<b>Remarks:</b> Controls emerged weeds. Apply prior, during, or after planting, but before corn emerges. Use a spreader.				
Paraquat (Gramoxone Inteon)	Sweet Corn	Directed spray	0.25	0.25
<b>Remarks:</b> Apply when corn is at least 10" tall. Arrange nozzles to spray no higher than the lower 3 inches of the corn plant. Corn plants shorter than 10" may be injured and not recover. (Corn height measured from soil surface to top of whorl.)				
Pendimethalin (Prowl) + Atrazine (Several)	Sweet Corn	Early Postemergence	0.75 - 1.0 1.0 - 1.5	1.0 - 2.0 1.0 - 2.0
<b>Remarks:</b> In Alabama, Florida and Georgia, Prowl 3.3 EC can be applied with atrazine early postemergence. Apply from spike through 4 leaf stage but before weeds exceed 1 inch in height, except for Texas panicum which must be no larger than the 2 leaf stage. Prowl alone will not control emerged weeds. Wait at least 7-10 days before cultivation early postemergence treatments.				

Table 7. Continued.

Herbicide	Labeled crops	Time of application to crop	Rate (lbs. AI./Acre)	
			Mineral	Muck
Tembotrione (Laudis)	Sweet Corn	Post emergence	0.08	0.08
<p><b>Remarks:</b> Apply at 3 fl oz/A to sweet corn from emergence to V7 growth stage for the control of a broad spectrum of broadleaf and grass weeds. The use of a methylated seed oil and a nitrogen source (UAN or AMS) is recommended for best weed control. The addition of atrazine plus a COC may increase the weed control spectrum. Check the label for plant-back of sensitive crops.</p>				
Topramezone (Impact)	Sweet Corn	Postemergence	0.016	0.016
<p><b>Remarks:</b> Apply to emerged actively growing weeds. Impact is a systemic postemergence herbicide. The addition of 0.25 to 1.0 lb ai of atrazine will enhance control. Not all sweet corn hybrids have been tested. Test each new hybrid before applying to the whole fields.</p>				

Table 8. Disease management for sweet corn.

Chemical (a.i.)	Fungicide Group <sup>1</sup>	Maximum Rate/Acre/		Min. Days to Harvest	Pertinent Diseases	Remarks <sup>2</sup>
		Application	Season			
Amistar 80DF (Azoxystrobin)	11	5 oz	2.5 lb	7	Common and southern rust Northern corn leaf blight Southern corn leaf blight	Do not exceed 1 sequential and 6 total appl. of Amistar or other QoI fungicides
Apron XL LS (Mefenoxam)	4	0.64 fl. oz./100 lb seed or 2.2 fl oz/100 lb seed			Pythium seedling blight Downy mildew	Seed treatment only. Use the higher rate if treating seed for prevention of systemic downy mildew
Chlorothalonil Products (See individual labels), including Applause 720, Bravo Ultrex, Bravo Weather Stik, Chloronil 720, Echo 720, Echo 90DF, Equus 720, Equus DF, 82.5 WDG (Chlorothalonil)	M5	See label	See label	14	Common and southern rust Northern corn leaf blight Southern corn leaf blight	Do not use crop for live-stock feed
Copper-Count-N	M1	2qt			Bacterial rot, bacterial wilt, Bacterial stripe, Leaf blights, Stalk rot	
Mancozeb Compounds (See individual labels), including Dithane-DF-Rainshield, Dithane -F45 Rainshield, Dithane-M45, Manzate, Manzate 75DF, Manzate Flowable, Manzate Prostik, Penncozeb 4L, Penncozeb 75DF, Penncozeb 80WP (Ethylene bisdithiocarbamate with zinc)	M3	See label	See label	7	Common and southern rust Northern corn leaf blight Southern corn leaf blight	Do not use crop for live-stock feed
Maneb Compounds (See individual labels), including Maneb 75DF, Maneb 80WP, Manex (Ethylene bisdithiocarbamate)	M3	See label	See label	7	Common and southern rust Northern corn leaf blight Southern corn leaf blight	Do not use crop for live-stock feed

Table 8. Continued.

Chemical (a.i.)	Fungicide Group <sup>1</sup>	Maximum Rate/Acre/		Min. Days to Harvest	Pertinent Diseases	Remarks <sup>2</sup>
		Application	Season			
Kaligreen (Potassium bicarbonate)		3 lb				Do not mix with highly acidic pesticides
Fosphite (Potassium phosphite)		3 qt	18 qt		<i>Pythium</i> , <i>Rhizoctonia</i> , <i>Fusarium</i> , Downy mildew	Do not exceed 6 appl./per crop. See label for foliar, and irrigation application details
Fungi-phite (Potassium phosphite)		2 qt	12 qt		<i>Pythium</i> , <i>Rhizoctonia</i> , <i>Fusarium</i> , Downy mildew	Do not exceed 6 appl./per crop. See label for foliar, and irrigation application details
Headline EC (Pyraclostrobin)	11	12 fl oz	72 fl oz	7	Common and southern rust Northern corn leaf blight Southern corn leaf blight	Do not exceed 2 sequential and 6 total appl. of Headline or other QoI fungicides
Maxim 4FS (Fludioxonil)	12	0.16 fl oz/ 100 lb of seed			Various seedling diseases	Seed treatment only
Miconized Gold (Sulfur)	M2	5 lb				Do not apply during periods of warm weather
Propiconazole Products (See individual labels), including Bumper 41.8EC, Tilt 3.6EC Propimax EC	3	4 fl oz	16 fl oz	14	Common and southern rust Northern corn leaf blight Southern corn leaf blight	Do not apply more than 4 applications per season
Quadris (Azoxystrobin)	11	15.4 fl oz	3.75 qt	7	Common and southern rust Northern corn leaf blight Southern corn leaf blight	Do not exceed 2 sequential and 6 total appl. of Quadris or other group 11 fungicides
Quilt (Azoxystrobin/ Propiconazole)	11, 3	14 fl oz	56 fl oz	14	Common and southern rust Northern corn leaf blight Southern corn leaf blight	Alternate Quilt with Tilt or another product with a mode of action other than a group 11 fungicide
Serenade Max ( <i>Bacillus subtilis</i> strain QST 713)		3 lb		0	Common and southern rust Northern corn leaf blight Southern corn leaf blight	
Sonata ( <i>Bacillus pumilus</i> strain QST 2808)		4 qt		0	Common and southern rust Northern corn leaf blight Southern corn leaf blight	
Stratego EC (Trifloxystrobin/propiconazole)	11, 3	10 fl oz	30 fl oz	14	Common and southern rust Northern corn leaf blight Southern corn leaf blight	Alternate with a fungicide of dissimilar mode of action
Sulfur 90W (Sulfur)	M2					Do not apply during periods of warm weather
Topaz (Potassium phosphite)		3 qt	18 qt	0	Various (see label)	Do not make more than six applications per season
Trilogy (Neem oil)		2 gal			Various (see label)	Apply at a rate of 0.5% - 1.0% in 25 to 100 gallons of water per acre or at 2 pt in a minimum of 5 GPA for low volume applications
Yellow Jacket Wettable Sulfur (Sulfur)	M2	5 lb			Various (see label)	Do not apply during periods of warm weather

**Table 9.** Selected insecticides approved for use on insects attacking sweet corn.

Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code <sup>1</sup>	Notes
<b>Agree WG</b> ( <i>Bacillus thuringiensis</i> subspecies <i>aizawai</i> )	1.0-2.0 lb	4	0	lepidopteran larvae (cat- erpillar pests)	11B1	Apply when larvae are small for best control. OMRI-listed <sup>2</sup> .
<b>*Ambush 25W</b> (permethrin)	6.4-16 oz	12	1	aster leafhopper, corn earworm, corn rootworm (adults), cutworms, fall armyworm	3	Do not apply more than 1.2 lb ai/ acre per season.
<b>*Asana XL (0.66EC)</b> (esfenvalerate)	5.8-9.6 fl oz	12	1	aphids, armyworms, banded cucumber beetle, beet armyworm (aids in control), chinch bugs, corn borer, corn ear- worm, corn rootworm, corn silk fly, cutworms, flea beetles, grasshop- pers, sap beetle (adults), stalkborers, tarnished plant bug	3	Do not apply more than 0.5 lb ai/ acre per season (10 applications at highest rate).
<b>Avaunt</b> (indoxacarb)	2.5-3.5 oz	12, (14 days for hand har- vesting)	3, (35 for fodder & stover)	corn earworm, fall army- worm	22	Whorl application (before silking) only. No more than 4 applications per season.
<b>Aza-Direct</b> (azadirachtin)	1-2 pts, up to 3.5 pts, if needed	4	0	aphids, beetles, cat- erpillars, leafhoppers, leafminers, mites, stink bugs, thrips, weevils, whiteflies	un	Antifeedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> .
<b>Azatin XL</b> (azadirachtin)	5-21 fl oz	4	0	aphids, beetles, caterpil- lars, leafhoppers, leaf- miners, thrips, weevils, whiteflies	un	Antifeedant, repellent, insect growth regulator.
<b>*Baythroid XL</b> (beta-cyfluthrin)	0.8-2.8 fl oz	12	0	chinch bugs, common stalk borers, corn ear- worm, corn rootworm adult, corn silk fly, cut- worms, fall armyworm (1st and 2nd instars only), grasshoppers, true armyworm	3	Maximum number of applications: 10. Maximum amount allowed per season: 28 fl oz/acre.
<b>Belt SC</b> (flubendiamide)	2.0-3.0 fl oz	12	1	armyworms, black cut- worm, corn earworm, European corn borer	28	Do not apply more than 12 fl oz/ acre per season.
<b>Biobit HP</b> ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	0.5-2.0 lb	4	0	caterpillars (will not con- trol large armyworms)	11	Treat when larvae are young. Good coverage is essential. Can be used in the greenhouse. OMRI- listed <sup>2</sup> .
<b>BotaniGard 22 WP, ES</b> ( <i>Beauveria bassiana</i> )	<b>WP:</b> 0.5-2 lb/100 gal <b>ES:</b> 0.5-2 qts/100 gal	4	0	aphids, thrips, whiteflies	--	May be used in greenhouses. Contact dealer for recommenda- tions if an adjuvant must be used. Not compatible in tank mix with fungicides.

Table 9. Continued.

Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code <sup>1</sup>	Notes
<b>Cobalt</b> (chlorpyrifos, gamma-cyhalothrin)	13-38 oz	24	21	aphids, armyworms, beetles, billbugs, chinch bugs, grasshoppers, green cloverworm, lesser cornstalk borer, stalk borer, stink bugs	1B, 3	See label for application methods and restrictions.
<b>*Counter 15G Lock 'n Load</b> (terbufos)	6.0-8.0 oz per 1000 ft of row, banded or in furrow post emergence incorporated, 8 oz per 1000 ft of row at cultivation	48	60	billbugs, chinch bugs <sup>(1)</sup> , corn rootworm, cutworms (suppression), flea beetles, lesser corn stalk borer (suppression), maize billbug, seedcorn beetle, seedcorn maggot, symphylans, thrips, white grubs, wireworms	1B	<sup>(1)</sup> Early season control of light to moderate infestations. Only one application (at-planting, post-emergence incorporated, or cultivation time treatment) per season. Do not exceed 8.7 lb/acre.
<b>Crymax WDG</b> ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	0.5-2.0 lb	4	0	caterpillars	11	Use high rate for armyworms. Treat when larvae are young.
<b>Deliver</b> ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	0.25-1.5 lb	4	0	caterpillars	11	Use higher rates for armyworms. OMRI-listed <sup>2</sup> .
<b>DiPel DF</b> ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	0.5-2.0 lb	4	0	caterpillars	11	Treat when larvae are young. Good coverage is essential. OMRI-listed <sup>2</sup> .
<b>Entrust</b> (spinosad)	0.5-2 oz	4	1 day - ears 7 day - forage	armyworms, beet armyworm, corn earworm	5	Do not apply more than 9 oz per acre per year. OMRI-listed <sup>2</sup> .
<b>Extinguish</b> (S)-methoprene)	1-1.5 lb	4	0	fire ants	7A	Slow-acting IGR (insect growth regulator). Best applied early spring and fall where crop will be grown. Colonies will be reduced after three weeks and eliminated after 8 to 10 weeks. May be applied by ground equipment or aerially.
<b>*Force 3G</b> (tefluthrin)	depends on row spacing	0	at planting or cultivation within 30 days of seeding emergence	billbugs <sup>(1)</sup> , chinch bugs <sup>(1)</sup> , corn rootworm, cutworms, lesser cornstalk borer, red imported fire ant <sup>(2)</sup> , seedcorn beetle, seedcorn maggot, white grubs, wireworms	3	Only one application per crop. Granules must be incorporated. <sup>(1)</sup> suppression only <sup>(2)</sup> suppression for 28 days
<b>*Furadan 4F, *LFR</b> (carbofuran)	2.5 oz/1000 ft	48	at planting	corn rootworms, flea beetles, seedcorn maggot, wireworms	1A	See restrictions for very sandy soil.
<b>Gaucho 480F</b> (imidacloprid)	1-8 fl oz/cwt of seed	12	seed treatment	cornleaf aphid (early season), flea beetles, imported fire ant, seedcorn maggot, wireworms	4A	See label for detailed directions.
<b>Javelin WG</b> ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	0.12-1.50 lb	4	0	most caterpillars, but not <i>Spodoptera</i> species (armyworms)	11	Treat when larvae are young. Thorough coverage is essential. OMRI-listed <sup>2</sup> .

Table 9. Continued.

Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code <sup>1</sup>	Notes
<b>*Lannate LV, *SP</b> (methomyl)	<b>LV:</b> 0.75-1.5 pts <b>SP:</b> 0.25-0.50 lb	48	0 - ears 3 - forage 21 - sto- ver	aphids, armyworm, beet armyworm, corn ear- worm, corn rootworm adults, fall armyworm, flea beetles, picnic bee- tles, variegated cutworm	1A	Certain hybrid varieties are sus- ceptible to methomyl injury. Treat a small area to determine safety first.
<b>*Larvin 3.2</b> (thiodicarb)	20-30 fl oz	48	0	beet armyworm, cut- worms, corn earworm, fall armyworm, southern armyworm	1A	Do not allow livestock to graze treated field. Do not feed treated corn silage or fodder to livestock. See label for special instructions for cutworms.
<b>Lepinox WDG</b> ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	1.0-2.0 lb	12	0	for most caterpillars, including beet armyworm (see label)	11	Treat when larvae are small. Thorough coverage is essential.
<b>*Lorsban 75WG</b> (chlorpyrifos)	0.33-1.33 lb	24	21 (grain or ears)	aphids, beet armyworm, chinch bugs, corn ear- worm, corn rootworm adult, cutworms, fall armyworm, grasshoppers	1B	Do not feed treated corn silage, forage, or fodder, or allow live- stock to graze.
<b>15G, 75 WG</b>	See label for rates.	24	at plant- ing	billbugs, corn rootworm larvae, cutworms, lesser corn stalk borer, seed corn maggot, symphy- lans, wireworms	1B	See label.
<b>*Mocap 15G</b> (ethop- rop)	See label.	48	at plant- ing	corn rootworms, cut- worms, symphylans, wireworms, (suppression of white grubs)	1B	
<b>M-Pede 49% EC</b> Soap, Insecticidal	1-2% V/V	12	0	aphids, armyworms, leaf- hoppers, mites, thrips	--	OMRI-listed <sup>2</sup> .
<b>*Mustang Max EC, EW</b> (zeta-cypermethrin)	2.24-4.0 oz	12	3	aphids, armyworms, chinch bug, corn bor- ers, corn earworm, corn silkyfly, cutworms, flea beetles, grasshoppers, leafhoppers, sap beetle adults	3	Maximum of 0.15 lb ai/acre per season.
<b>Neemix 4.5</b> (azadirachtin)	4-16 fl oz	12	0	aphids, armyworms, corn earworm, thrips	un	OMRI-listed <sup>2</sup> .
<b>Oil, insecticidal</b>	1-2 gal/100 gal, depending on brand	4	0	aphids, armyworms, corn earworms, corn root- worms, mites, thrips	--	
<b>*PennCap-M 2EC</b> (methyl parathion)	1-3 pt	4 days - See label	4	aphids, corn earworm, corn rootworm adult, cutworms, flea beetles, grasshoppers, sap beetles, silk fly, true armyworm	1B	See restrictions on label.

Table 9. Continued.

Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code <sup>1</sup>	Notes
<b>*Pounce 1.5 G</b> (permethrin)	8 oz/1000 ft	12	at plant- ing	armyworms, cutworms	3	
	6.7-13.3 lb		pre-emer- gence	armyworms, cutworms, stalk borers	3	
	6.7-13.3 lb		foliar - 1	armyworms, corn borers, cutworms, stalk borers	3	
<b>Proaxis Insecticide</b> (gamma-cyhalothrin)	2.56-3.84 fl oz	24	1 - ears 21 - for- age or fodder	beet armyworm, chinch bug, corn earworm, cutworms, fall army- worm(1), flea beetles, grasshoppers, sap bee- tles, southern armyworm, sting bugs, yellowstriped armyworm	3	(1) 1 <sup>st</sup> or 2 <sup>nd</sup> instars
<b>Pyrellin EC</b> (pyrethrin + rotenone)	1-2 pt	12	12 hours	aphids, flea beetles, leaf- hoppers, loopers, mites, thrips	3, 21	
<b>Radiant SC</b> (spinetoram)	3-6 fl oz	4	1 - grain 3 - forage or fodder	armyworms, corn ear- worm	5	No more than 6 applications per year.
<b>Sevin 80S; 4F; XLR</b> (carbaryl)	<b>80S:</b> 1.25-2.5 lb <b>4F; XLR:</b> 1-2 qt	12	2 - Ears 14 - Forage 48 - Fodder	armyworms, chinchbugs, corn earworms, corn rootworm adult, cut- worms, fall armyworm, flea beetles, leafhoppers, sap beetles	1A	Highly toxic to bees.
<b>SpinTor 2 SC</b> (spinosad)	1.5-6 fl oz	4	1	armyworms, corn ear- worm	5	Do not apply more than 29 fl oz per acre per year.
<b>*Telone C-35</b> (dichlo- ropropene + chloropi- crin)	See label.	5 days - See label	preplant	symphylans, wireworms	--	See supplemental label for use restrictions in south and central Florida.
<b>*Telone II</b> (dichloropropene)						
<b>*Thimet 20-G</b> (phorate)	See label. No more than 6.5 lb	48	at plant- ing, see label	corn rootworms, flea beetles, mites, seedcorn beetle, seed corn maggot, white grubs, wireworms	1B	One application per season.
<b>*Thionex 3EC</b> <b>*Thionex 50W</b> (endo- sulfan)	1.33-2 qt 2-3 lb	24	1	corn earworm, corn leaf aphid, whiteflies	2	Do not apply to sweet corn to be processed or used to feed live- stock. Do not make more than 3 applications per year.
<b>Trilogy</b> (extract of neem oil)	0.5-2.0% V/V	4	0	aphids, mites, sup- pression of thrips and whiteflies	un	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed <sup>2</sup> .

Table 9. Continued.

Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code <sup>1</sup>	Notes
* <b>Warrior II</b> (lambda-cyhalothrin)	0.33 fl oz per 1000 ft of row (at plant)  0.96-1.92 fl oz (foliar)	24	1  21 for feeding livestock	aphids <sup>(1)</sup> , aster leafhopper, beet armyworm, chinch bugs, corn earworm, corn rootworm, cutworms, fall armyworm, flea beetles, grasshoppers, mites <sup>(1)</sup> (see label for more details), southern armyworm, stink bugs, tarnished plant bug, yellowstriped armyworm	3	( <sup>1</sup> ) suppression only.
<b>Xentari DF</b> ( <i>Bacillus thuringiensis</i> subspecies <i>aizawai</i> )	0.5-2.0 lb	4	0	caterpillars	11	Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse. Can be used in organic production.
<p><b>The pesticide information presented in this table was current with federal and state regulations at the time of revision. The user is responsible for determining the intended use is consistent with the label of the product being used. Use pesticides safely. Read and follow label instructions.</b></p>						
<p><sup>1</sup> Mode of Action codes for vegetable pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v. 6.1 August 2008.</p> <p>1A. Acetylcholinesterase inhibitors, Carbamates (nerve action)  1B. Acetylcholinesterase inhibitors, Organophosphates (nerve action)  2A. GABA-gated chloride channel antagonists (nerve action)  3. Sodium channel modulators (nerve action)  4A. Nicotinic acetylcholine receptor agonists (nerve action)  5. Nicotinic acetylcholine receptor allosteric activators (nerve action)  6. Chloride channel activators (nerve and muscle action)  7A. Juvenile hormone mimics (growth regulation)  7C. Juvenile hormone mimics (growth regulation)  9B and 9C. Selective homopteran feeding blockers  10. Mite growth inhibitors (growth regulation)  11. Microbial disruptors of insect midgut membranes  12B. Inhibitors of mitochondrial ATP synthase (energy metabolism)  15. Inhibitors of chitin biosynthesis, type 0, lepidopteran (growth regulation)  16. Inhibitors of chitin biosynthesis, type 1, homopteran (growth regulation)  17. Molting disruptor, dipteran (growth regulation)  18. Ecdysone receptor agonists (growth regulation)  22. Voltage-dependent sodium channel blockers (nerve action)  23. Inhibitors of acetyl Co-A carboxylase (lipid synthesis, growth regulation)  28. Ryanodine receptor modulators (nerve and muscle action)  un. Compounds of unknown or uncertain mode of action</p> <p><sup>2</sup> OMRI listed: Listed by the Organic Materials Review Institute for use in organic production.</p> <p><b>* Restricted Use Only.</b></p>						

**Table 10.** Breakeven production costs for sweet corn at various yield levels in the Miami-Dade County area, 2005-2006.

	Cost per acre	Yield (crates/acre)				
		250	275	300	325	350
Variable Costs	\$2,007.93	\$8.03	\$7.30	\$6.69	\$6.18	\$5.74
Fixed Costs	\$1,579.61	\$6.32	\$5.74	\$5.27	\$4.86	\$4.51
Harvest Cost/unit		\$3.28	\$3.28	\$3.28	\$3.28	\$3.28
Total Cost/unit		\$17.63	\$16.33	\$15.24	\$14.32	\$13.53

**Table 11.** Breakeven production costs for sweet corn at various yield levels in the Palm Beach County area, 2005-2006.

	Cost per acre	Yield (cwt/acre)				
		200	225	250	275	300
Variable Costs	\$1,805.17	\$9.03	\$8.02	\$7.22	\$6.56	\$6.02
Fixed Costs	\$1,528.26	\$7.64	\$6.79	\$6.11	\$5.56	\$5.09
Harvest Cost/unit		\$3.28	\$3.28	\$3.28	\$3.28	\$3.28
Total Cost/unit		\$19.95	\$18.10	\$16.61	\$15.40	\$14.39