F. Commodity Recommendations

Pesticide Use Disclaimer

THE LABEL IS THE LAW
Before using a pesticide, check the label for up to date rates and restrictions.

Labels can be downloaded from: *http://www.cdms.net/, https://www.greenbook.net/* or *http://www.agrian.com/labelcenter/results.cfm*

For more information on Pesticide Safety and the Pesticide Label see chapter D.

Guide to the Recommended Pesticide Tables in the Following Crop Sections:

1. Pesticides are listed by **group or code number based on chemical structure and mechanism of action**, as classified by the Weed Science Society of America (WSSA) for herbicides, the Insecticide Resistance Action Committee (IRAC) for insecticides, and the Fungicide Resistance Action Committee (FRAC) for fungicides.
   If the number is in bold font, the product may have resistance concerns.

2. For **restricted use pesticides**, the restricted active ingredients are labeled with a *****. (See section D 3.2.1 "Restricted Use Classification Statement" for more information).

3. **In addition to the pesticides listed below, other formulations or brands with the same active ingredient(s) may be available. ALWAYS CHECK THE LABEL:**
   a) to ensure a pesticide is labeled for the same use,
   b) to ensure the pesticide is labeled for the desired crop, and
   c) for additional restrictions.

4. All pesticide recommendations are made for spraying a **broadcast area of 1 acre** (43,560 square feet). **Adjust the rate for banded applications** (for more information, see section E 1.3 Calibrating Granular Applicators).

5. Check the label for the maximum amount of pesticide per application and the maximum number of applications per year.

6. **Bee Toxicity Rating (Bee TR)**: N=nontoxic; L=minimum impact on bees; M=moderately toxic, can be used if dosage, timing and method of application are correct, but should NOT be applied directly to the crop if bees are present; H=highly toxic, severe losses expected, -- = data not available.

Beets (Garden)

Beets are frost tolerant and produce the best commercial quality when grown during cool temperatures (50-65°F, 10-18°C). Lighter color and wider zoning occur during rapid growth in warm temperatures. Beets will form seed stalks if exposed to temperatures below 50°F (10°C) for 2 or 3 weeks after several true leaves have formed. Beets have a high boron requirement - see Plant Nutrient Recommendations below.

Recommended Varieties[1]

Market	Hybrid	Days	Color	Shape	Use
Avalanche	No	50	White	Round	Roots, bunching
Boro	Yes	51	Red	Globe	Roots, tops, bunching, baby beets
Chioggia Guardsmark	No	60	Purple w White Zones	Globe	Roots
Cylindra	No	54	Red	Cylindrical	Roots, bunching
Eagle	Yes	50	Red	Globe	Roots, bunching
Early Wonder	No	52	Red	Globe	Greens, bunching
Greentop Bunching	No	58	Red	Round	Greens, bunching
Kestrel	Yes	53	Red	Globe	Roots, Bunching
Merlin	Yes	55	Red	Globe	Roots
Pacemaker III	Yes	53	Red	Globe	Roots, bunching
Red Ace	Yes	53	Red	Globe	Roots, bunching
Red Atlas	Yes	55	Red	Globe	Roots, bunching, processing, pigment
Red Cloud	Yes	53	Red	Round	Roots, bunching
Red Kite	Yes	55	Red	Globe	Roots, bunching, processing
Red Titan	Yes	60	Red	Globe	Roots, bunching, processing, pigment
Ruby Queen	No	55	Red	Round	Roots, bunching
Solo	Yes	50	Red	Globe	Roots, bunching (mono-germ)
Touchstone Gold	No	60	Gold	Round	Roots, bunching
Zeppo	Yes	50	Red	Round	Roots, bunching

[1]Listed alphabetically

Recommended Nutrients Based on Soil Tests

In addition to using the table below, check the suggestions on rate, timing, and placement of nutrients in your soil test report and chapter B Soil and Nutrient Management. Your state's soil test report recommendations and/or your farm's nutrient management plan supersede recommendations found below.

		Soil Phosphorus Level				Soil Potassium Level				
		Low	Med	High (Opt)	Very High	Low	Med	High (Opt)	Very High	
Beets[1]	**N (lb/A)**	**P_2O_5 (lb/A)**				**K_2O (lb/A)**				**Nutrient Timing and Method**
	75-100	150	100	50	0	150	100	50	0	Total nutrient recommended
	50	150	100	50	0	150	100	50	0	Broadcast and disk-in
	25-50	0	0	0	0	0	0	0	0	Sidedress 4-6 weeks after planting

[1]Apply 1.5-3 lb/A of boron (B); see also Table B-7 in chapter B Soil and Nutrient Management.

Boron Deficiency and Black Spot Boron (B) deficiency can cause black spots inside roots and large black dry rots on root surfaces. B deficiency is most likely to occur in alkaline soils high in calcium and is exacerbated by dry conditions. Apply B at planting according to soil test results.

Seed Treatment Use treated seed to prevent disease, see Disease Control below for more information.

Seeding and Spacing Seed from early April to mid-August. Germination temperatures range from 50-85°F (10-29°C). For fresh market beets, sow seeds ½ inch deep at the rate of 12 seeds/ft of row. Space rows 15-20 inches apart; thin plants to 3 inches apart. Narrow row systems with between row spacings of 6-12 inches and in-row seeding rates of 8 seeds per foot are appropriate for processing beets. Processing beets are precision planted to achieve final stands for intended processing use. Beet "seeds" are dried fruits with 1-3 seeds. Seed companies can provide sprout counts to more accurately determine seeding rates for precision planting.

Harvest and Post-Harvest Considerations

Market beets are harvested when they reach a size of 1.5-3 inches in diameter. Beet tops for greens may be cut and handled like spinach or Swiss chard. For bunching beets, roots are undercut and carefully pulled by the tops. For

larger acreages, beets for roots may be topped and machine dug using a modified potato digger.

Store beets at 32°F (0°C) and 98-100% relative humidity. Like other root crops, beets are well adapted to storage. Topped beets stored at 32°F can keep 4-6 months. Cold storage or cool-cellar storage are both suitable, provided the humidity is kept sufficiently high to prevent dehydration. Before storage, beets should be topped and sorted to remove the ones with disease symptoms or mechanical injuries. Beets should not be stored in large bulk. They should be stored in well-ventilated containers such as ventilated bin boxes or slatted crates to help dissipate respiratory heat. Increased carbon dioxide concentrations (5-10%) in beet storage increases fungal spoilage.

Bunched beets and beet greens are much more perishable than topped beets, but they can be stored at 32°F for 10-14 days. A relative humidity of at least 95% is desirable to prevent wilting. Air circulation should be adequate to remove respiration heat but not so rapid that it speeds up transpiration and wilting. Satisfactory precooling is accomplished by vacuum cooling or hydrocooling. Crushed ice helps keep the bunched beets cold, especially if refrigeration is not available. Bunched beets are commonly shipped with package and top ice to maintain freshness.

Weed Control

THE LABEL IS THE LAW-see the Pesticide Use Disclaimer on the first page of chapter F.

Recommended Herbicides

1. Identify the weeds in each field and select recommended herbicides. More information is available in the "Herbicide Effectiveness on Common Weeds in Vegetables" (Table E-2) in chapter E Pest Management.

2. Minimize herbicide resistance development. Identify the herbicide site of action group number and follow recommended good management practices; **bolded group numbers in tables below are herbicides at higher risk for selecting resistant weed populations.** Include non-chemical weed control whenever possible.

1. Soil-Applied (Preplant Incorporated)

Group	Product Name	Product Rate	Active Ingredient (*=Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
8	Ro-Neet 6E	1.67 to 2 qt/A	**cycloate**	2.5 to 3 lb/A	--	48

-Preplant incorporated only; incorporate into 3 to 4 inches of soil immediately after application. Plant any time after treatment. Use on mineral soils **only**. Use lower rate on sandy soils and higher rate on heavier soils.
-**Do not** apply over 150 lb N/A when applying this herbicide in conjunction with a fluid fertilizer.

2. Postemergence

Group	Product Name	Product Rate	Active Ingredient (*=Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
1	Select 2EC Select Max 0.97EC	6 to 8 fl oz/A, 12 to 16 fl oz/A	**clethodim**	0.07 to 0.12 lb/A	30	24
	Poast 1.5EC	1 to 2.5 pt/A	**sethoxydim**	0.2 to 0.5 lb/A	60	12

-**Select 2EC**: use crop oil concentrate (COC) at 1% v/v (1 gal/100 gal of spray solution). **Select Max**: use nonionic surfactant (NIS) at 0.25% v/v (1 qt/100 gal of spray solution). **Poast**: Apply with COC at 1.0% v/v. -**The use of COC may increase the risk of crop injury when hot or humid conditions prevail.** To reduce the risk of crop injury, omit additives or switch to NIS when grasses are small and soil moisture is adequate. -Use lower labeled rates for annual grass control and higher labeled rates for perennial grass control.
-Yellow nutsedge, wild onion, wild garlic, and broadleaf weeds will not be controlled.
-Controls many annual and certain perennial grasses, including annual bluegrass, but Poast is preferred for goosegrass control. For best results, treat annual grasses when they are actively growing and before tillers are present. Control may be reduced if grasses are large or under hot or dry weather conditions. Repeated applications may be necessary to control certain perennial grasses. If repeated applications are necessary, allow 14 days between applications.
-**Do not** tank-mix with or apply within 2 to 3 days of any other pesticide, unless labeled, as this may increase the risk of crop injury or reduce the control of grasses. **Do not** apply more than 8 fl oz of Select 2EC in a single application and **do not** exceed 2 pt/A for the season; **do not** apply more than 16 fl oz of Select Max in a single application and **do not** exceed 4 pt/A for the season.
-**Do not** apply more than 2.5 pt/A Poast in single application and **do not** exceed 5 pt/A for the season. Rainfastness is 1 h.

5	Spin-Aid 1.3EC	1.5 to 3 pt/A	**phenmedipham***	0.244 to 0.488 lb/A	60	12

-**For use in DE, MD, NJ, PA, and VA only. See label for application restrictions, mixing instructions, and weather restriction to prevent crop injury or herbicide failure.** Multiple applications may be applied to ground to control early germinating weeds. Apply 1.5 pt/A after the 2-leaf stage. Increase rate up to 2.3 pt/A after the 4-leaf stage. Increase rate up to 3 pt/A after the 6-leaf stage. Repeat applications may be made 5 to 7 days later, or when another flush of weeds germinates. A maximum of 3 applications is allowed.
-Spin-Aid is effective on brassica species including wild mustard, shepherdspurse, and London rocket. Other weeds controlled include common chickweed, common lambsquarters, groundcherry, purslane, common ragweed, and annual sowthistle.
-**Do not** apply this product through any type of irrigation system. **Do not** spray when conditions for drift are favorable or while dew is present. Leave a 16 ft buffer from the treated area when the wind direction is toward sensitive plants.

2. Postemergence, Spin-Aid - continued on next page

2. Postemergence, Spin-Aid - continued

-Spin-Aid may cause injury if the crop is under stress as the result of rapid changes in weather from cool, overcast days to hot (>75°F), bright days; windy conditions; drought; use of preplant herbicides, preemergence herbicides, or other chemicals; insect or disease injury; or close cultivation. Rainfastness is 6 h.

3. Other Labeled Herbicides These products are labeled but limited local data are available; and/or are labeled but not recommended in our region due to potential crop injury concerns.

Group	Product Name	Active Ingredient (*=Restricted Use)
2	UpBeet	**triflusulfuron**
4	Stinger	**clopyralid**
14	Vida	**pyraflufen**
14	Aim	**carfentrazone**

Insect Control

THE LABEL IS THE LAW-see the Pesticide Use Disclaimer on the first page of chapter F. Recommended Insecticides

Aphids

Apply one of the following formulations:

Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
3A	Bifenthrin 2EC, others	5.12 to 6.40 fl oz/A	bifenthrin*	1	12	H
4A	Admire Pro	4.4 to 10.5 fl oz/A	imidacloprid - **soil**	21	12	H
4A	Admire Pro	1.2 fl oz/A	imidacloprid - **foliar**	7	12	H
4A	Actara 25WDG	1.5 to 3.0 oz/A	thiamethoxam	7	12	H
4A	Platinum 75SG	1.70 to 4.01 oz/A	thiamethoxam	AP	12	H
4C	Transform WG	0.75 to 1.5 oz.A	sulfoxaflor	7	24	H
4D	Sivanto Prime or 200SL	7.0 to 14.0 fl oz/A	flupyradifurone - **foliar**	7	4	M

Beet Armyworms and Webworms

Apply one of the following formulations:

Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
5	Blackhawk 36WG	2.25 to 3.5 oz/A	spinosad	3	4	M
5	Radiant SC	6.0 to 8.0 fl oz/A	spinetoram	7	4	M
11A	XenTari (OMRI)	0.5 to 2.0 lb/A	*Bacillus thuringiensis aizawai*	0	4	N
18	Intrepid 2F	4.0 to 10.0 fl oz/A	methoxyfenozide	1	4	L
22	Avaunt 30WDG, Avaunt eVo	3.5 to 6.0 oz/A	indoxacarb	7	12	H
28	Coragen 1.67SC	3.5 to 7.5 fl oz/A	chlorantraniliprole - **foliar**	1	4	L

Flea Beetles

Apply one of the following formulations:

Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Sevin XLR Plus	0.5 to 1.0 qt/A	carbaryl	7	12	H
3A	Bifenthrin 2EC, others	5.12 to 6.40 fl oz/A	bifenthrin*	1	12	H
3A	Hero EC	2.6 to 6.1 fl oz/A	zeta-cypermethrin* + bifenthrin*	1	12	H
3A	Mustang Maxx	1.76 to 4.0 fl oz/A	zeta-cypermethrin*	1	12	H
4A	Admire Pro	4.4 to 10.5 fl oz/A	imidacloprid - **soil**	21	12	H
4A	Admire Pro	1.2 fl oz/A	imidacloprid - **foliar**	7	12	H
4A	Actara 25WDG	1.5 to 3.0 oz/A	thiamethoxam	7	12	H
4A	Platinum 75SG	1.70 to 4.01 oz/A	thiamethoxam	AP	12	H

Leafminers

Apply one of the following formulations:

Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
5	Blackhawk 36WG	2.25 to 3.5 oz/A	spinosad	3	4	M
5	Radiant SC	6.0 to 8.0 fl oz/A	spinetoram	7	4	M

Disease Control

THE LABEL IS THE LAW-see the Pesticide Use Disclaimer on the first page of chapter F. Recommended Fungicides

Seed Treatment Use seed treated with Apron XL LS (0.085 to 0.64 fl oz/100 lb) or Allegiance FL (0.75 fl oz/100 lb) for *Pythium* damping-off protection *plus* Maxim 4FS (0.08 to 0.16 fl oz/100 lb) for *Rhizoctonia* and *Fusarium* protection. Seed treatments are not a substitute for high quality seed.

Damping-Off caused by *Phytophthora, Pythium,* and *Rhizoctonia*

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Apply one of the following preplant incorporated or as a soil-surface spray after planting:						
4	Ridomil Gold 4SL	1.0 to 2.0 pt/A	mefenoxam	0	48	N
4	Ultra Flourish 2E	2.0 to 4.0 pt/A	mefenoxam	0	48	N
4	MetaStar 2E AG (see label)	4.0 to 8.0 pt/A	metalaxyl	14	48	N
Apply the following as an in-furrow spray only for *Pythium* and *Rhizoctonia* control:						
4 + 11	Uniform 3.66SE[1]	0.34 fl oz/1000 ft row	mefenoxam + azoxystrobin	AP	0	N

Leaf Spots (*Cercospora* and *Alternaria*) and other foliar diseases

Allow 2 to 3 years between beet plantings. Thoroughly disc under crop residues as pathogens can overwinter on residues. Warm, wet weather and rainfall favor leaf spot development. Scout plantings regularly, especially if wet weather persists. Apply one of the fungicides listed below preventatively and/or when weather conditions are favorable for disease development. Repeat every 7 to10 days. **Do not** make more than 2 sequential applications of Cabrio, or 1 application of a FRAC code 11 fungicide, before alternating to a non-FRAC code 11 fungicide. **Tank mix fungicides with fixed copper** to help reduce fungicide resistance development. Resistance of Cercospora leaf spot (CLS) to FRAC code 11 has been reported in table and sugar beets and to FRAC code 3 in sugar beets. In cases of suspected resistance, tank mixing a copper-based fungicide with the biofungicides Double Nickel (OMRI), LifeGard (OMRI) or Regalia (OMRI) have provided some suppression of CLS. Repeated scouted is needed during the season to identify potential cases of fungicide resistance.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
M01	copper (OMRI)[1]	at labeled rates	copper	0	48	N
Rotate one of the following FRAC code 11 fungicides plus a fixed copper at labeled rates:						
11	azoxystrobin 2.08F[2,3]	6.0 to 15.5 fl oz/A[2,3]	azoxystrobin	0	4	N
11	Cabrio 20EG	8.0 to 12.0 oz/A	pyraclostrobin	0	12	N
11	Flint Extra 500SC	2.0 to 2.9 fl oz/A	trifloxystrobin (**Do not apply near Concord grapes**, see label)	7	12	N
11	Reason 500SC	8.2 fl oz/A[4]	fenamidone	14	12	--
With one of the following:						
3	tebuconazole 3.6F	4.0 to 6.0 fl oz/A	tebuconazole	7	12	N
3	Tilt 3.6EC[5]	3.0 to 4.0 fl oz/A[5]	propiconazole	14	12	N
7	Fontelis 1.67SC	16.0 to 30.0 fl oz/A	penthiopyrad	0	12	L
7 + 9	Luna Tranquility 4.16SC	8.0 to 11.2 fl oz/A	fluopyram + pyrimethanil	7	12	--
7 + 11	Merivon 2.09SC	4.0 to 5.5 fl oz/A[6]	fluxapyroxad + pyraclostrobin	7	12	N

[1]There are several copper-based products with OMRI labels; see labels for specifics. Copper applications may help suppress some fungal pathogens in organic production systems. [2]9.0 to 15.5 fl oz/A for Cercospora leaf spot; [3]Poor control with azoxystrobin (FRAC code 11) has been reported in southern NJ; [4]Alternaria leaf spot suppression only; [5]Cercospora leaf spot only; [6]Use 5.5 fl oz/A for Cercospora leaf spot.

Pocket Rot, Wirestem, Stem Canker, and Crown Rot (*Rhizoctonia solani*)

Pocket rot and other diseases caused by *Rhizoctonia* are most prevalent in cool, wet soils and especially in plantings showing poor plant vigor. Rotate between fields each year and scout on a regular basis.

Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
11	azoxystrobin 2.08F[1]	0.40 to 0.80 fl oz/1000 ft row, banded or in-furrow	azoxystrobin	0	4	N
4 + 11	Uniform 3.66SE [1,2]	0.34 fl oz/1000 ft row	mefenoxam+azoxystrobin	AP	0	N

[1]See label for specific details. [2]Also for *Pythium* damping-off

For Immediate Medical Attention

Call 911

For a Pesticide Exposure Poisoning

Emergency Call

POISON Help®

1-800-222-1222

For All States

This number will automatically connect you to the poison center nearest to you.
Anyone with a poisoning emergency can call the toll-free telephone number for help. Personnel at the Center will give you first-aid information and direct you to local treatment centers if necessary.

For Pesticide Spills

Small Spills: See the product label for cleanup advice.
Large spills: Call the National Response Center at 1-800-424-8802 or CHEMTREC at 800-424-9300 (24 hours) - Industry assistance with emergency response cleanup procedures for large, dangerous spills.
Be aware of your responsibility to report spills to the proper state agency.