

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.

Okra

Recommended Varieties

Note: Okra is a tropical annual with a wide range of adaptation. However, okra is very sensitive to frost and cold temperatures and should not be planted until soil has warmed in the spring. Varieties below are listed alphabetically.

Variety	Hybrid	Height (ft)	Days	Pod Color
Candle Fire	Yes	4	60	Red
Carmine Splendor	Yes	4	51	Red
Clemson Spineless 80	No	6	55	Green
Clemson Spineless 99	No	4	55	Green
Jambalaya	Yes	4	50	Dark Green
Red Burgundy	No	4	55	Red-Burgundy
Zarah	Yes	3-4	42	Dark Green

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.

Okra	N (lb/A)	Soil Phosphorus Level				Soil Potassium Level				Nutrient Timing and Method
		Low	Med	High (Opt)	Very High	Low	Med	High (Opt)	Very High	
		P ₂ O ₅ (lb/A)				K ₂ O (lb/A)				
	100-150 ¹	250	150	100	0	250	150	100	0	Total nutrient recommended
	50-100	250	150	100	0	250	150	100	0	Broadcast and disk-in
	25-50	0	0	0	0	0	0	0	0	Sidedress or fertigate 3-4 w after planting
	25-50	0	0	0	0	0	0	0	0	Sidedress or fertigate 6-8 w after planting

Apply 1-2 lb/A of boron (B) with broadcast fertilizer; see also Table B-7 in chapter B Soil and Nutrient Management.

¹For drip/trickle fertilization, see section C 3 Fertigation in the Irrigation Management chapter.

Seed Treatment See Disease Control for seed treatment to prevent disease.

Seeding and Spacing

Field seeding is usually done between May 20 and June 1. Generally, only one planting is made. In northern areas of the region, sow seed in the greenhouse in cell trays in early May and transplant to the field through black plastic mulch on raised beds with drip irrigation in early to mid-June, two rows per bed, 12 inches between plants in the row. For direct seeding, drill seeds ¼-½ inch deep, 2-4 per ft of row (3-7 lb/A). Thin the plants when they are 5 inches tall to 12-15 inches apart in the row. Space the rows 3-3½ ft apart.

Harvest and Post-Harvest Considerations

Okra pods usually reach harvesting maturity 4-6 days after the flowers open. At this stage, the pods are 3-3½ inches long, free of excessive fiber and tender. Pick pods at 2-day intervals by snapping off or clipping the pedicel. Avoid bruising pods during harvest. Gloves should be worn to avoid skin reactions to the fine spines on the fruit. Large and undesirable pods should be removed to keep the plant productive over a longer period. Harvested okra should be kept at 50-55°F (10-13°C) and 85-90% relative humidity. Below 50°F, okra pods are subject to chilling injury.

Weed Control

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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 or Preemergence)						
Group	Product Name	Product Rate	Active Ingredient (*= Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
3	Treflan 4EC	1.0 to 2.0 pt/A	trifluralin	0.5 to 0.75 lb/A	--	12
<p>-Incorporate into 2-3 inches of soil within 8 hr after application. Primarily controls annual grasses and a few broadleaf weeds. -Do not use (or reduce the rate) used when cold, wet soil conditions are expected, or crop injury may result. -Poor incorporation can reduce overall weed control. Maximum application not addressed on label.</p>						
27	Callisto 4SC	6.0 fl oz/A	mesotrione	0.188 lb/A	28	12
<p>-Use as row-middle or hooded post-directed treatment, but not both. -Apply as a band, leaving 1 foot of untreated soil over the seeded row (6" of untreated soil on each side of the row); do not apply over the row or severe injury will occur. If replanting, do not plant into treated soil. -Callisto controls common lambsquarters, pigweeds, as well and many other small-seeded annual broadleaf weeds, but Callisto is weak on ragweed and morninglory species. Apply Treflan 4EC between the rows of mulch to control annual grasses. -Crop injury may occur if an organophosphate or carbamate insecticide is applied within 7 days of Callisto. -Do not apply more than 1 application of Callisto per crop; do not apply more than 6 fl oz per year as a banded application.</p>						
2. Postemergence						
Group	Product Name	Product Rate	Active Ingredient (*= Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
1	Select Max 0.97EC	9 to 16 fl oz/A	clethodim	0.07 to 0.12 lb/A	3	24
	Poast 1.5EC	1.0 to 1.5 pt/A	sethoxydim	0.2 to 0.3 lb/A	14	12
<p>-Select Max has a supplemental label for okra (expires 5/23/2021). -Select Max: use nonionic surfactant (NIS) at 0.25% v/v (1 qt/100 gal of spray solution); Poast: Use crop oil concentrate at 1.0% v/v (1.0 gal/100 gal of spray solution). The use of oil concentrate 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 nonionic surfactant (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, or broadleaf weeds will not be controlled. -Controls many annual and certain perennial grasses, including annual bluegrass. 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 needed to control certain perennial grasses. If repeat 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 16 fl oz of Select Max in a single application and do not exceed 2 qt/A for the season. Do not apply more than 1.5 pt/A Poast in single application and do not exceed 5.5 pt/A for the season.</p>						
22	Gramoxone SL 2.0	1.95 pt/A	paraquat*	0.49 lb/A	21	24
<p>-Row middles as a shielded application. Include a nonionic surfactant at 0.25% v/v. Use shields or hoods to prevent spray contact with the crop and low spray pressure (maximum of 30 psi) to reduce small droplets that are prone to drift. See the label for additional information and warnings. -Rainfastness is 30 min. A maximum of 3 applications per year are allowed. -Restricted-use pesticide. Only certified applicators, who successfully complete the paraquat-specific training, can mix, load or apply paraquat. Application of paraquat "under the direct supervision" of a certified applicator is no longer allowed. -Required training link (http://usparaquattraining.com); certified applicators must repeat training every three years.</p>						
27	Callisto 4SC	3.0 fl oz/A	mesotrione	0.094 lb/A	28	12
<p>-Use as row-middle or hooded post-directed treatment, but not both. -Apply as a direct spray using a hooded sprayer. Okra must be at least 3 inches tall at time of application. -Use a nonionic surfactant at 0.25% v/v (1 qt/100 gal). -Set spray equipment to minimize amount of Callisto that comes in contact with okra foliage or crop injury will occur. -Callisto controls common lambsquarters, pigweeds, as well and many other small-seeded annual broadleaf weeds, but Callisto is weak on ragweed and morninglory species. Apply Treflan 4EC between the rows of mulch to control annual grasses. -Crop injury may occur if an organophosphate or carbamate insecticide is applied within 7 days of Callisto. -Rainfastness is 1 h. -Do not apply more than 1 application of Callisto per crop; do not apply more than 3 fl oz/A per year as a post-directed application.</p>						
3. Postharvest						
Group	Product Name	Product Rate	Active Ingredient (*= Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
22	Gramoxone SL 2.0	2.25 to 3 pt/A	paraquat*	0.56 to 0.75 lb/A	--	24
<p>-A Supplemental Label in DE for the use of Gramoxone SL 2.0 for postharvest application to desiccate the crop. -Apply after the last harvest for bareground or plasticulture. Always include an adjuvant. -Spray coverage is essential for optimum effectiveness. See the label for additional information and warnings. -Rainfastness 30 min. A maximum of 2 applications for crop desiccation are allowed. Restricted-use pesticide. Only certified applicators, who successfully complete the paraquat-specific training, can mix, load or apply paraquat. Application of paraquat "under the direct supervision" of a certified applicator is no longer allowed. -Required training link (http://usparaquattraining.com); certified applicators must repeat training every three years.</p>						
4. 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	Sandea	halosulfuron				
5	Caparol	prometryn				
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

Cotton/melon aphids and green peach aphid (GPA) are most common on okra. In the summer, GPA winged females can produce numerous pale yellow or pink colored live young (nymphs). GPA are larger than cotton/melon aphids. Cotton/melon aphids are yellow. Tremendous numbers of aphids can build up on the undersides of leaves and on pods often following pyrethroid insecticide applications. Aphids are sucking insects that excrete a sugary, sticky substance (“honeydew”) that can coat fruit and cause growth of black sooty mold fungus. Both honeydew and mold can hurt marketability. Predators and parasitoids (braconid wasps) often can keep aphid populations below damaging levels. Broad spectrum insecticides, like pyrethroids, destroy these natural enemies. Preserve natural enemies by using selective insecticides whenever possible. Sample plants for aphids as well as the presence of natural enemy species. Spray only when aphid densities appear to be increasing in the absence of predators.

Apply one of the following formulations (note: spray coverage to the underside of the leaf is important):						
Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
1B	Malathion 57 EC	1.5 pt/A	malathion	1	12	H
4A	Admire Pro	7.0 to 14.0 fl oz/A	imidacloprid - soil	21	12	H
4A	Admire Pro	1.3 to 2.2 fl oz/A	imidacloprid - foliar	0	12	H
4A	Assail 30SG	2.0 to 4.0 oz/A	acetamiprid	7	12	M
4C	Closer SC	1.5 to 2.0 fl oz/A	sulfoxaflor	1	12	H
4C	Transform WG	0.75 to 1.0 oz/A	sulfoxaflor	1	24	H
4D	Sivanto Prime or 200SL	21.0 to 28.0 fl oz/A	flupyradifurone - soil	45	4	M
4D	Sivanto Prime or 200SL	7.0 to 12.0 fl oz/A	flupyradifurone - foliar	1	4	M
9D	Sefina	3.0 fl oz/A	afidopyropen	0	12	L
23	Movento	4.0 to 5.0 fl oz/A	spirotetramat	1	24	L
28	Exirel	13.5 to 20.5 fl oz/A	cyantraniliprole	1	12	H
28	Verimark (melon aphid)	6.75 to 10.0 fl oz/A	cyantraniliprole	1	4	H
28 + 6	Minecto Pro	10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H
29	Beleaf 50SG	2.8 to 4.3 oz/A	flonicamid	0	12	L

Corn Earworm, armyworm, European corn borer, and other lepidopteran “worm” pests

Corn Earworm (CEW) is a lepidopteran pest of okra that appears when moths emerge from drying field corn. Moths lay a single egg on a leaf. Larvae vary in color (yellow, brown, green or red) but display longitudinal light-colored stripes and black dots from which hair grow. CEW larvae can be distinguished from other larvae due to the presence of hair on their body. Larvae will attack fruit almost immediately following their emergence. Scouting for signs of their presence is necessary. Pheromone traps can also be used to determine periods of moth activity.

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	1.0 to 1.5 qt/A	carbaryl	3	12	H
3A	Pyrethroid insecticides registered for use on Okra: see table at the end of Insect Control.					
5	Entrust SC (OMRI)	3.0 to 6.0 fl oz/A	spinosad	1	4	M
5	Radiant SC	5.0 to 10.0 fl oz/A	spinetoram	1	4	M
11A	Dipel DF, others (OMRI)	0.5 to 1.0 lb/A	<i>Bacillus thuringiensis kurstaki</i>	0	4	N
11A	XenTari (OMRI)	0.5 to 2.0 lb/A	<i>Bacillus thuringiensis aizawai</i>	0	4	N
15	Rimon 0.83EC	9.0 to 12.0 fl oz/A	novaluron	1	12	M
22	Avaunt 30WDG, Avaunt eVo	3.5 oz/A	indoxacarb	3	12	H
28	Coragen 1.67SC	3.5 to 7.5 fl oz/A	chlorantraniliprole - soil	1	4	L
28	Coragen 1.67SC	3.5 to 7.5 fl oz/A	chlorantraniliprole - foliar	1	4	L
28	Exirel	7.0 to 13.5 fl oz/A	cyantraniliprole	1	12	H
28	Verimark	5.0 to 10.0 fl oz/A	cyantraniliprole	1	4	H
28	Harvanta 50SL	10.9 to 16.4 fl oz/A	cyclaniliprole	1	4	H
28 + 6	Minecto Pro	5.5 to 10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H

Japanese beetles

Adult Japanese beetles emerge in June and can cause substantial feeding damage on okra leaves. They skeletonize leaves leaving a lace-like appearance.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
1B	Malathion 57 EC	1.5 pt/A	malathion	1	12	H
3A	Pyrethroid insecticides registered for use on Okra: see table at the end of Insect Control.					

Stink Bugs

Multiple species may damage fruit including brown and green stink bugs, and the invasive brown marmorated stink bug (BMSB). Stink bugs have a characteristic shield shape, a triangle on their thorax, are approximately 0.5 inch long and can emit a foul odor when disturbed. BMSB can be distinguished from the native brown stink bug by the white stripes on the antennae. BMSB nymphs have characteristic black and white striped legs and a dark colored or dark and white body, depending on the instar or stage of development. Stink bug eggs are in masses, barrel shaped and cream to greenish colored. Both nymphs and adults remove fluid from the fruit tissue, leaving a conspicuous white “halo” or discoloration on the surface. BMSB feeding injury can be significantly more severe than that of other species. Growers should scout for their presence on plants, and initiate weekly sprays if observed.

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	1.0 to 1.5 qt/A	carbaryl	3	12	H
3A	Pyrethroid insecticides registered for use on Okra: see table at the end of Insect Control.					

Whiteflies

Whiteflies can be found on the underside of leaves where they aggregate in numbers. When disturbed, the white, tiny moth-like adults will fly off but quickly return to the plant. Nymphs and adults feed by removing fluids from plant material, creating stippling, yellowing and distortion of the leaves. Whiteflies also secrete honeydew, leaving a conspicuous sticky, shiny appearance to the plant during times of heavy infestation.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
4A	Admire Pro	7.0 to 14.0 fl oz/A	imidacloprid - soil	21	12	H
4A	Admire Pro	1.3 to 2.2 fl oz/A	imidacloprid - foliar	0	12	H
4C	Closer SC	4.25 to 4.5 fl oz/A	sulfoxaflor	1	12	H
4C	Transform WG	2.0 to 2.25 oz/A	sulfoxaflor	1	24	H
4D	Sivanto Prime or 200SL	21.0 to 28.0 fl oz/A	flupyradifurone - soil	45	4	M
4D	Sivanto Prime or 200SL	10.5 to 14.0 fl oz/A	flupyradifurone - foliar	1	4	M
7C	Knack	8.0 to 10.0 fl oz/A	pyriproxyfen	1	12	L
9B	PQZ	2.4 to 3.2 fl oz/A	pyrifluquinazon	1	12	L
9D	Sefina	14.0 fl oz/A	afidopyropen	0	12	L
15	Rimon 0.83EC	12.0 fl oz/A	novaluron	1	12	M
16	Courier SC	9.0 to 13.6 fl oz/A	buprofezin	1	12	L
21A	Portal XLO	2.0 pt/A	fenpyroximate	1	12	L
23	Movento	4.0 to 5.0 fl oz/A	spirotetramat	1	24	L
28 + 6	Minecto Pro	10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H

Group 3A Pyrethroid Insecticides Registered for Use on Okra

Apply one of the following formulations (check if the product label lists the insect you intend to spray; the label is the law):						
Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR	
Brigade 2EC, others	2.1 to 6.4 fl oz/A	bifenthrin*	7	12	H	
Declare	0.77 to 1.54 fl oz/A	gamma-cyhalothrin*	5	24	H	
Hero EC	4.0 to 13.0 fl oz/A	zeta-cypermethrin* + bifenthrin*	7	12	H	
Lambda-Cy 1EC, others	1.92 to 3.84 fl oz/A	lambda-cyhalothrin*	5	24	H	
Mustang Maxx	2.24 to 4.0 fl oz/A	zeta-cypermethrin*	1	12	H	
Warrior II	0.96 to 1.92 fl oz/A	lambda-cyhalothrin*	5	24	H	

Group 3A Pyrethroid Insecticides Registered for Use on Okra - continued on next page

Group 3A Pyrethroid Insecticides Registered for Use on Okra - continued

Combo products containing a pyrethroid					
Brigadier	3.8 to 9.85 fl oz/A	bifenthrin* + imidacloprid (Group 4A) - foliar	7	12	H
Swagger	7.6 to 19.6 fl oz/A	bifenthrin* + imidacloprid (Group 4A) - foliar	7	12	H

¹Resistance concerns with western flower thrips.

Disease Control

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Nematode Control

Okra roots are very susceptible to the damage caused by root knot and sting nematodes. See also sections E 1.5 Soil Fumigation and E 1.6 Nematode Control. Use the fumigants listed in section E 1.5 or the nematicide in the table below. Consult the label.

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
Incorporate or drip-apply 7 days before planting:						
--	Nimitz 4EC	3.5 to 5.0 pt/A	fluensulfone	n/a	12	N

Seed Treatment

Use thiram 480DP at 3.0 to 4.0 oz/100 lb of seed (2/3 tsp/lb) *plus* Apron XL LS (0.32 to 0.64 fl oz/100 lb of seed) for improved germination and stand.

Damping-off caused by *Rhizoctonia*

For control of seedling root rot and basal stem rot apply the following fungicide:

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
11	azoxystrobin 2.08F	0.40 to 0.80 fl oz/1000 row ft	azoxystrobin	0	4	N

Fungal Diseases

Fruit Rot (*Choanephora*)

Choanephora is a soil-borne fungal disease, which attacks senescent blossoms and fruit. There are no fungicides labeled for Choanephora control. Improving air circulation is the only effective means of reducing the chances for Choanephora development. In extreme cases, growers may remove the lower juvenile leaves to improve air circulation.

Fusarium and Verticillium Wilts

Rotate with non-solanaceous crops and avoid planting in fields with a history of either disease. If rotation is not an option, soil fumigation will help reduce soil population of causal agents. Use the fumigants listed in section E 1.5 Soil Fumigation. If fumigation with synthetic chemicals is not possible, biofumigation with mustard or anaerobic soil disinfestation should be helpful.

Cercospora Leaf Spot and Powdery Mildew

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
Rotate the following every 7 d as long as weather conditions favor disease development:						
M01	copper (OMRI) ¹	at labeled rates	copper	0	48	N
M05	chlorothalonil 6F ²	1.5 pt/A	chlorothalonil	7	12	N
3	Folicur 3.6F ³	4.0 to 6.0 fl oz/A	tebuconazole	4	12	N
11	azoxystrobin 2.08F ⁴	6.0 to 15.5 fl oz/A	azoxystrobin	0	4	N

¹There are several copper-based products with OMRI labels. See labels for specifics. Copper applications for bacterial disease control may help suppress some fungal pathogens in organic production systems. ² Cercospora and Powdery mildew. ³ Cercospora only. ⁴ Powdery mildew only.

For Immediate Medical Attention

Call 911

**For a Pesticide Exposure Poisoning
Emergency Call**



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.