

Pesticide	Use Category <sup>1</sup>	Hours to Reentry	Days to Harvest
<b>INSECTICIDE</b>			
<i>Bacillus thuringiensis</i>	G	4	0
bifenthrin	R	12	7
carbaryl	G	12	3
chlorantraniliprole	G	4	1
flubendiamide	G	12	1
flubendiamide + buprofezin	G	12	1
imidacloprid (soil/foliar)	G	12	21/5
indoxacarb	G	12	3
malathion	G	12	1
pyriproxyfen	G	12	14
spinetoram	G	4	1
spinosad	G	4	1
zeta-cypermethrin	R	12	1
zeta-cypermethrin+bifenthrin	R	12	7
<b>FUNGICIDE (FRAC code)</b>			
chlorothalonil (Group M5)	G	12	3
Folicur (Group 3)	G	12	7
Quadris (Group 11)	G	4	0

See Table D-6.

<sup>1</sup> G = general

**Nematode Control**

Nematode control is very important in the production of this commodity. See Chapter E, "Nematodes" section of "Soil Pests--Their Detection and Control". Use fumigants listed in the "Soil Fumigation" section.

**Disease Control**

**Seed Treatment**

Use thiram 75WP at 3 to 4 ounces per 100 pounds (2/3 teaspoon per pound) plus Apron XL LS (0.32 to 0.64 fluid ounce) per 100 pounds of seed for improved germination and stand.

**Damping-Off**

Use seed treated with thiram plus Apron XL LS (0.32 to 0.64 fl oz) per 100 pounds of seed.

**Seedling Root Rot and Basal Stem Rot (Rhizoctonia)**

Apply Quadris--0.40-0.80 fl oz 2.08SC/1000 row ft

**Fusarium and Verticillium Wilts**

Avoid planting in fields where either disease is present. Rotate with non-solanaceous crops.

**Fruit Rot**

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, some growers remove the lower juvenile leaves to improve air circulation.

**Leaf Spots**

chlorothalonil--1.5 pt 6F/A or OLF, or Folicur--4.0--6.0 floz 3.6F/A or OLF, or Quadris--6.0--15.5 floz 2.08SC/A

**ONIONS**

**Varieties**

Varieties <sup>1</sup>	DE	MD	NJ	PA	VA	WV
<b>Bulb Types: Sets (Yellow)</b>						
Candy* (Sweet Spanish type)				P	V	WV
Delgado				P		
Early Yellow Globe	D	M		P		WV
Ebenezer	D	M		P	V	WV
<b>Bulb Types: Sets (Red)</b>						
Southport Red Globe				P		
<b>Bulb Types: Seed (Yellow)</b>						
Candy* (Sweet Spanish type)	D		N	P	V	WV
Fortress (PRR)				P		
<b>Bulb Types: Transplants (white)</b>						
Belo Blanco*			N			
<b>Bulb Types: Transplants Intermediate Day</b>						
Candy* (Sweet Spanish type)			N	P	V	WV
Condor* (FT,PRT) (Sweet Spanish type)				P		WV
Expression* (Sweet Spanish type)				P	V	
Exacta			N	P	V	
Mars* (red)				P		WV
Medallion				P		
Mercury* (red)				P		
Mesquite*			N			
Prince*			N			
Super Star* (white, Sweet Spanish type)				P	V	WV
Sweet Spanish types	D	M	N	P	V	WV
Talon*			N			
Tequila*			N	P		
<b>Bulb Types: overwintering</b>						
T-420*			N	P		
Hi-keeper*			N			
<b>Green or Bunching</b>						
Beltsville Bunching	D	M	N	P		WV
Evergreen Bunching (overwinter)	D	M	N	P		WV
Kincho (summer)	D		N	P		
Southport White Globe (overwinter or early spring harvest only)	D	M	N	P		WV
Tokyo Bunching (summer)	D	M	N			WV
White Sweet Spanish	D	M		P		WV

<sup>1</sup> Varieties listed alphabetically

\* Indicates hybrid varieties

Letters in parentheses indicate disease resistance possessed by varieties. See the "Abbreviations" section in front portion of this publication.

**Recommended Nutrients Based on Soil Tests**

Before using the table below, refer to important notes in Plant Nutrient Recommendations in Section B, Soil And Nutrient Information. These notes provide additional suggestions to adjust rate, timing and placement of nutrients depending on soil type cation exchange capacity and existing fertility levels.

Crop	Pounds N per Acre	Soil Phosphorus Level			Soil Potassium Level		
		Low	Med	Opt.	Low	Med	Opt.
		Pounds P <sub>2</sub> O <sub>5</sub> per Acre			Pounds K <sub>2</sub> O per Acre		
Bulb onions	75-100 <sup>1</sup>	200 <sup>1</sup>	100 <sup>1</sup>	50 <sup>1</sup>	200 <sup>1</sup>	100 <sup>1</sup>	50 <sup>1</sup>
	50-75 <sup>2</sup>	200 <sup>2</sup>	100 <sup>2</sup>	50 <sup>2</sup>	200 <sup>2</sup>	100 <sup>2</sup>	50 <sup>2</sup>
	25-50 <sup>3</sup>	0	0	0	0	0	0
Green onions	150-200 <sup>1</sup>	200 <sup>1</sup>	100 <sup>1</sup>	50 <sup>1</sup>	200 <sup>1</sup>	100 <sup>1</sup>	50 <sup>1</sup>
	50-75 <sup>2</sup>	200 <sup>2</sup>	100 <sup>2</sup>	50 <sup>2</sup>	200 <sup>2</sup>	100 <sup>2</sup>	50 <sup>2</sup>
	50 <sup>3</sup>	0	0	0	0	0	0
	50 <sup>4</sup>	0	0	0	0	0	0

<sup>1</sup>Total amount nutrient recommended; growers producing vegetables on soils with high clay contents should reduce the recommended nitrogen and potassium rates by 20% and increase the phosphorus rate by 25%.

<sup>2</sup>Suggested method of application broadcast and disk-in

<sup>3</sup>Sidedress 4-5 weeks after planting

<sup>4</sup>Sidedress 3-4 weeks before harvest

Apply 1 - 2 pounds of boron (B) per acre with broadcast fertilizer. See Table B-10 for more specific boron recommendations.

### Seed Treatment

Buy commercial fungicide treated seed, if available. See the Disease section for more information.

### Transplant Production

Produce onion transplants in cell trays. The maximum cell size recommended for Sweet Spanish transplants is 338 cells per tray. Grow transplants 10-12 weeks and maintain a plant height of 4 inches.

### Planting and Seeding Dates

For dry bulb onions, sets and seed can be planted as soon as soil conditions are favorable in the spring. Transplants for bulb onions can be planted March 20 to April 1.

Seed for bunching onions can be planted as soon as soil conditions are favorable in the spring. Successive plantings can be made through the summer.

### Spacing

For dry bulb onions, space rows 24 inches apart. Space eight to nine sets per foot (24 bushels per acre). For large Spanish onions, space sets 4 to 5 inches apart and seeds ½ to 2 inches in row (2 pounds per acre using split shoe). For bunching onions, space rows 12 to 16 inches apart; space seed ½ to 1½ inches apart (7 to 10 pounds per acre). Depth to seed ½ to ¾ inch except ½ to 1 inch on muck. Place sets 1 to 1½ inches deep.

For seedling transplants, grow 4 rows on a raised bed with plastic mulch. Space rows 6 inches apart and space plants 6 inches apart in each row (approximately 50,000-60,000 plants/A). Use one drip tape line between each two rows of onions on the raised beds for optimum growth and water management.

### Cultivation

For bunching onions, hill 1 to 2 inches to ensure white base.

### Drying

When at least 50% of onion tops have fallen over, start harvesting onion bulbs. Pull bulbs through the plastic mulch and lay on mulch surface for 3 days if there is no

rain predicted. If rain is predicted within 24 hours, cut tops from onion bulbs (leaving 1.5 inch neck) and place bulbs in potato burlap bags or bulk bins and bring into shelter. If bulbs are placed in burlap bags, they can be placed in a greenhouse or high tunnel for 5 to 7 days to dry. Place sheet of row cover over burlap bags of onions to reduce/eliminate sunburn. If using bulk bins for drying onions, place in room with high air flow and a controlled heat source (drying temperature for onions should never exceed 90°F). Keep in dryer with moderate heat and high air flow for at least 48 hours. Before removing bulk bins from dryer, randomly check onion necks to insure they are paper dry. If storing onion bulbs for a short period of time (up to 2 months), maintain cool temperature (38°F to 45°F) and low relative humidity (75-85%) with active air movement.

### Weed Control

Identify the weeds in each field and select recommended herbicides that control those weeds. See Tables E-2 and E-3.

Match preplant incorporated and preemergence herbicide rates to soil type and percent organic matter in each field.

Find the herbicides you plan to use in the Herbicide Resistance Action Committee's (HRAC) **Herbicide Site of Action Table E-7** and follow the recommended good management practices to minimize the risk of herbicide resistance development by weeds in your fields.

### Preemergence

DCPA--6-10.5 lb/A. Apply 8 to 14 pints per acre

Dacthal 6F at time of seeding or immediately after planting sets. A second application may be needed for longer season seed onions.

### Preplant Incorporated or Preemergence

Bensulide--5-6 lb/A. Apply 5 to 6 quarts per acre Prefar 4E before planting and incorporate 1 to 2 inches deep with power-driven rotary cultivators, or apply preemergence and activate with one-half inch of sprinkler irrigation within 36 hours to control most annual grasses. Use the maximum recommended rate preemergence followed by irrigation to suppress certain annual broadleaf weeds including common lambsquarters, smooth pigweed, and common purslane.

### Postemergence

Clethodim--0.094-0.125 lb/A. Apply 6 to 8 fluid ounces per acre Select 2EC with oil concentrate to be 1 percent of the spray solution (1 gallon per 100 gallons of spray solution) or 12 to 16 fluid ounces of Select Max 0.97EC with nonionic surfactant to be 0.25% of the spray solution (1 quart per 100 gallons of spray solution) postemergence to control many annual and certain perennial grasses, including annual bluegrass. Select will not consistently control goosegrass. The use of oil concentrate with Select 2EC 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 when grasses are small and soil moisture is adequate. Control may be reduced if grasses are large or if hot, dry weather or drought conditions occur. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. Yellow nutsedge, wild onion, or broadleaf weeds will not be controlled. Do not tank-mix with or apply within 2 to 3 days of any other

pesticide unless labeled, as the risk of crop injury may be increased, or reduced control of grasses may result. Observe a minimum preharvest interval of 45 days and apply no more than 32 fluid ounces per acre in one season. Labeled for dry bulb onions only.

Fluazifop--0.125-0.188 lb/A. Apply 0.5 to 0.75 pints per acre Fusilade DX 2E with oil concentrate to be 1 percent of the spray solution (1 gallon per 100 gallons of spray solution) or a nonionic surfactant to be 0.25 percent of the spray solution (1 quart per 100 gallons of spray solution) postemergence to control annual grasses and certain perennial grasses. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. It will not control yellow nutsedge, wild onion, or any broadleaf weed. Do not tank-mix with any other pesticide unless labeled, as the risk of crop injury may be increased, or reduced control of grasses may result. Observe a minimum preharvest interval of 45 days and apply no more than 6 pints per acre in one season. Do not plant corn, sorghum, cereals, or any other grass crop within 60 days of the last application. Labeled for dry bulb onions only.

S-metolachlor--0.64-1.27 lb/A. A **Special Local-Needs 24(c) label has been approved for the use of Dual Magnum in dry bulb onions and green bunching onions in New Jersey, and in dry bulb onions in Virginia.** Apply 0.67 to 1.33 pints per acre after the onions have reached the two true leaf stage of growth. Use lower rate on lighter coarse-textured sandy soils and the higher rate on heavier fine-textured soils. Follow with overhead irrigation if rainfall does not occur. On soils with an organic matter content greater than 5 percent, one additional treatment may be applied 3 to 4 weeks after the first treatment. Primarily controls annual grass and certain broadleaf weeds, including galinsoga preemergence. Use other methods to control emerged weeds prior to application. Observe a 60-day preharvest interval. DO NOT exceed a total of 2.65 pints per acre per season. **Other generic versions of metolachlor and s-metolachlor may be available, and may or may not be labeled for use in the crop.** For use on dry bulb onions only.

Oxyfluorfen--0.025-0.06 lb/A. Apply 1.6 to 3.2 fluid ounces per acre Goal 2XL or 1 to 2 fluid ounces of GoalTender 4F postemergence when onions have a minimum of three true leaves to control seedling broadleaf weeds with four true leaves or less. Repeat the application but do not exceed a total of 0.5 pound per acre (32 fluid ounces per acre of Goal 2XL or 16 fluid ounces of GoalTender) and do not apply within 60 days of harvest.

Goal may cause injury to onion foliage. The injury will appear as necrotic spots on leaves and/or twisted leaves. Heed the following precautions to avoid or minimize injury: Use flat fan nozzles, 20 to 40 psi and 20 to 40 gallons of water per acre. DO NOT tank-mix with any other pesticide. DO NOT use surfactant, oil concentrates, or any other additive. DO NOT apply during extended periods of cool, wet, cloudy weather. DO NOT exceed 0.05 pound per acre (3.2 fluid ounces) per application. DO NOT apply to onions with less than three true leaves (do not count the flag leaf).

Bromoxynil--0.125-0.188 lb/A. Apply 4 to 6 fluid ounces Buctril 4EC to dry bulb onions with a minimum of 3 true

leaves (do not count the flag leaf) to suppress or control many seedling broadleaf weeds with 4 true leaves or less in 50 to 70 gallons of water per acre. Water volume is important. Concentrated spray solutions kill onions. Repeat applications can be made, but do not apply more than 12 fluid ounces in a single growing season. Buctril may cause injury to onions. The injury will appear as necrotic spots on the leaves. To minimize the risk of injury, heed the following warnings. DO NOT tank-mix with any other pesticides or apply within 3 days of any other pesticide. DO NOT add surfactants, oil concentrates, or other additives. DO NOT treat onions injured by sand, insects, or disease. DO NOT treat onions growing during periods of cloudy weather with high humidity or other low light intensity conditions that could result in "soft" foliage with a thinner-than-normal waxy layer on the leaf surface. DO NOT treat onions with less than 3 true leaves. DO NOT count the flag leaf.

Sethoxydim--0.2-0.3 lb/A. Apply 1 to 1.5 pints per acre Poast 1.5EC with oil concentrate to be 1 percent of the spray solution (1 gallon per 100 gallons of spray solution) postemergence to control annual grasses and certain perennial grasses. **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 when grasses are small and soil moisture is adequate. Control may be reduced if grasses are large or if hot, dry weather or drought conditions occur. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. Yellow nutsedge, wild onion, or broadleaf weeds will not be controlled. Do not tank-mix with or apply within 2 to 3 days of any other pesticide unless labeled, as the risk of crop injury may be increased, or reduced control of grasses may result. Observe a minimum preharvest interval of 30 days and apply no more than 3 pints per acre in one season.

### Postharvest

Paraquat--0.6 lb/A. A **Special Local-Needs 24(c) label has been approved for the use of Gramoxone Inteon 2SC or OLF for postharvest desiccation of the crop in Delaware and Virginia.** Apply 2.4 pints per acre Gramoxone Inteon 2SC or OLF as a broadcast spray after the last harvest. Add nonionic surfactant according to the labeled instructions. See the label for additional information and warnings.

### Insect Control

**NOTE:** Copies of specific insecticide product labels can be downloaded by visiting the websites [www.CDMS.net](http://www.CDMS.net) or [www.Greenbook.org](http://www.Greenbook.org). Also, specific labels can be obtained via web search engines.

### Onion Maggot

Continuous planting of onions on the same ground will increase onion maggot problems. Flies migrate up to one-half mile. Rotation is extremely important to reduce onion maggot damage. Avoid mechanical injury to bulbs in the field or during harvesting. Damaged plants encourage maggot infestation. Bury cull piles.

### Seed Treatment

Onion seed commercially-treated with cyromazine (Trigard ST) is available (pelleted). Growers must purchase seed treated by seed company.

### In-Furrow Planting Treatment

**Note.** In-furrow planting treatments may be more effective than postplanting treatments for onion maggot control.

diazinon (Diazinon 4E or OLF) preplant or in-furrow, or chlorpyrifos (**bulb only**) (Lorsban 4EC or OLF)

### Postplanting Spray Treatment

First-brood adult flies first appear in early to mid-May. Second brood occurs in July, and third brood occurs in August to September. The fall maggots are most important, because maggots may end up in stored onions, causing onion rot.

Crushed onions or culls attract onion maggot flies. Rotate fields if possible and eliminate culls. Foliar applications of insecticides are not likely to control maggot flies. Flies spend most of their time outside onion fields and must be contacted with the insecticide during application for control to occur. If a spray is applied, apply directly over the row. Soak soil around base of seedlings. **Note:** Permethrin also has a repellent effect.

gamma-cyhalothrin (Proaxis)  
malathion (Malathion 57EC or OLF)  
permethrin (Perm-UP, Pounce 3.2EC or OLF)  
zeta-cypermethrin (Mustang MAX, Respect)

### Cutworms

(Also see "Cutworms" section in Soil Pests--Their Detection and Control.)

gamma-cyhalothrin (**bulb only**) (Proaxis)  
lambda-cyhalothrin (**bulb only**) (Lambda-Cy, LambdaT, Silencer, Warrior II or OLF)  
methomyl (Lannate LV or OLF)  
zeta-cypermethrin (Mustang MAX, Respect or OLF)

### Leafminers

cyromazine (Trigard 75WP)  
spinosad (Entrust 80W, SpinTor 2SC or OLF)  
spinetoram (Radiant 2SC)

### Thrips

Frequently, thrips populations increase following adjacent alfalfa or grain harvest.

lambda-cyhalothrin (Lambda-Cy, LambdaT, Silencer, Warrior II or OLF)  
methomyl (Lannate LV or OLF)  
permethrin (Perm-UP, Pounce 3.2EC or OLF)  
spinetoram (Radiant 2SC)  
zeta-cypermethrin (Mustang MAX, Respect or OLF)

**Note:** use of spinosad for leafminer control will suppress thrips population.

Pesticide	Use Category <sup>1</sup>	Hours to Reentry <sup>2</sup>	Days to Harvest <sup>3</sup>
<b>INSECTICIDE</b>			
acetamiprid	G	12	7
chlorpyrifos	R	24	AP
cyromazine	G	12	60(AP) 7(foliar)
diazinon	R	72	AP
gamma-cyhalothrin	R	24	14
lambda-cyhalothrin	R	24	14
malathion	G	12	3
methomyl	R	48	7
permethrin	R	12	1
spinetoram	G	4	1
spinosad	G	4	1
zeta-cypermethrin	R	12	7
<b>FUNGICIDE (FRAC code)</b>			
Cabrio (Group 11)	G	12	7
chlorothalonil, dry onions (Group M5)	G	12	7
copper, fixed (group M1)	G	24	0
Endura (Group 7)	G	12	7
Folicur (Group 3)	G	12	7
iprodione (Group 2)	G	24	7
Inspire Super (Groups 3+9)	G	12	7
mancozeb (Group M3)	G	12, 24	7
Pristine (Groups 11 + 7)	G	12	7
Quadris (Group 11)	G	4	0
Quadris Opti (Groups 11 + M5) (dry bulb)	G	12	7
Reason (Group 11)	G	12	7
Ridomil Gold (Group 4)	G	48	7
Ridomil Gold Bravo, (Groups 4 + M5)	G	48	7
Ridomil Gold MZ (Groups 4 + M3)	G	48	7
Scala (Group 9)	G	12	7
Switch (Groups 9 + 12)	G	12	7

See Table D-6.

<sup>1</sup> G = general, R = restricted

<sup>2</sup> Chemicals with multiple designations are based on product and/or formulation differences. CONSULT LABEL.

<sup>3</sup> AP = At plant

## Disease Control

### Seed Treatment

Buy commercial fungicide treated seed, if available. Multiple fungicides are often needed to manage the diversity of soilborne fungi that cause seed decay. Check with your seed company to determine what seed treatment technology is available.

### Damping-Off

Apply mefenoxam--Ridomil Gold at 0.5 to 1.0 pt 4SL/A broadcast or banded immediately after seeding in the field.

### Downy Mildew

The pathogen can survive as oospores in the soil, or as mold on bulbs, sets and seed. Downy mildew development is promoted by cool, moist conditions. Control begins with planting disease-free seed or sets and crop rotations of at least 3 years without related crops. Be sure to eliminate

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culls and volunteers from the field. Apply the following fungicides accordingly:

mancozeb--3.0 lb 75DF/A, applied at 7-day intervals, or alternate with the following products if downy mildew has been observed in the field or region:

Ridomil Gold Bravo--2.5 pt SC/A SC/A, or  
Ridomil Gold MZ--2.5 lb 68WG/A, applied at 14-day intervals, or  
Quadris--9.0-15.5 fl oz 2.08SC/A, or  
Quadris Opti--2.4-3.6 pt 5.5SC/A, (dry bulb) apply in alternation with a fungicide that has a different mode-of-action on 5 to 7 day intervals, or  
Cabrio--12.0 oz 20EG/A, or  
Pristine--18.5 oz 38WG/A (suppression only)

If purple blotch and Botrytis blight are present, use the higher rate of Quadris Opti, and if Botrytis blight is severe, also consider tank-mixing with iprodione (Rovral-1.5 pt 4F/A or OLF).

### Purple Blotch (*Alternaria*)

The pathogen overwinters as mold in plant residue from onion-related plants. Purple blotch development is promoted by warm, moist conditions. Grow onions in well drained soil and rotate with non-related crops. Sweet Spanish types are especially susceptible to purple blotch.

Several of the most effective fungicides are listed below. Applications may be needed every 7 days for proper control. Rotate fungicides in different FRAC codes to slow the development of fungicide resistance (**NOTE:** iprodione applied at the high rate, and Pristine are labeled for use at 14-day intervals):

Quadris--6.2-12.3 fl oz 2.08SC, or  
Cabrio--8.0-12.0 oz EG/A, or  
Pristine--10.5-18.5 oz 38W/A at 14-day intervals (also will provide suppression of downy mildew), or  
chlorothalonil--1.0-3.0 pt 6F/A or OLF, or  
mancozeb--3.0 lb 75DF/A or OLF, or  
Quadris Opti--1.6-3.2 pt 5.5SC/A, or  
Endura--6.8 oz 70WG/A, or  
Reason--5.5 fl oz 500SC/A, or  
Ridomil Gold Bravo--2.5 pt SC/A

### Botrytis Leaf Blight

The pathogen overwinters in cull piles, on onion debris in the soil, and as sclerotia where related crops were recently grown. Botrytis leaf blight is promoted by moist, cool to mild conditions. Eliminate sources of inoculum and rotate 2 or 3 years between onion-related crops. Fungicide applications can be delayed until there is an average of 1 lesion on 10 leaves.

#### Apply and alternate between the following:

iprodione (Rovral)--1.5 pt 4F/A or OLF at 14-day intervals (for dry bulb onions only), or  
Switch--11.0-14.0 oz 62.5WG/A, or  
chlorothalonil--1.0-3.0 pt 6F/A or OLF, or  
Quadris--9.0-15.5 fl oz 2.08SC/A, or  
Quadris Opti--1.6-3.2 pt 5.5SC/A, or  
Inspire Super --16.0-20.0 fl oz 2.82EC/A, or  
Endura--6.8 oz 70WG/A, or  
Pristine--14.5-18.5 oz 38WG/A, or

Scala--9.0 oz SC/A + mancozeb--3.0 lb/A + chlorothalonil--1.5 pt/A (also effective against purple blotch).

Always alternate between materials from different FRAC codes to reduce chances for fungicide resistance development.

### Stemphylium Leaf Blight

Pristine--10.5-18.5 oz/A (will offer suppression to downy mildew at the higher rate), or  
Cabrio--8.0-12.0 oz 20EG/A (will offer suppression to botrytis leaf blight at the higher rate), or  
Switch--11.0-14.0 oz 62.5 WG/A, or  
iprodione (Rovral)--1.5 pt 4F/A or OLF.

### White Rot (*Sclerotium*)

White rot is most limiting in cool, moist soils and most severe on overwintered onions. The sclerotia can be long lived in the soil in the absence of an *Allium* host. White rot development is very dependant on soil temperatures with the optimum temperatures being between 60° and 65°F. Preplant soil fumigant may reduce number of sclerotia. Allow a 2- to 3-week waiting period after fumigation before seeding a fall crop:

Telone C-35--13.0-20.5 gal/A, or  
Vapam HL--50.0-75.0 gal/A, or apply  
Folicur--20.5 oz 3.6F/A in a 4 to 6 inch band over or into the furrow at planting. May also be applied by chemigation. Two additional foliar applications 4.0-6.0 fl oz/A may also be applied (dry bulb onion only)

### Bacterial diseases (Soft rot, Slippery Skin, Bacterial Canker and Sour Skin)

Plant seed and transplants that are pathogen free. Rotate to a non-host for 2 or more years and eliminate volunteer onions and weeds. Avoid overhead irrigation especially with water that may be contaminated with pathogen(s). Minimize injury to maturing or harvested bulbs. Dry mature bulbs as soon as possible after harvest.

Initiating a fixed copper-based bactericide program as soon as symptoms are first observed has been demonstrated to have limited benefit. Not all copper-based products are created equal and vary by copper content as well as active ingredient(s) (see Table E-12 for a list of available fixed-copper products and check label for rates).

### Neck Rot

Windrow plants to ensure dry tops before topping operation.  
iprodione (Rovral)--1.5 pt 4F/A or OLF at 14-day intervals (for dry bulb onions only)