

The fungus that causes cucurbit powdery mildew can develop resistance to high risk fungicides. Resistance to strobilurin (FRAC code 11) and DMI (FRAC code 3) fungicides have been reported in the Eastern U.S. Proper fungicide resistance management should be followed.

Powdery mildew generally occurs from mid-July until the end of the season. Observe fields for the presence of powdery mildew. If one lesion is found on the underside of 45 old leaves, begin the following fungicide program:

Alternate:

Rally--5.0 oz 40WSP/A *plus* chlorothalonil, or
Procure--4.0-8.0 oz 50WS/A *plus* chlorothalonil

With:

Quintec--6.0 fl oz 2.08SC *plus* chlorothalonil, or
Pristine--12.5-18.5 oz 38WG/A *plus* chlorothalonil

WHITE POTATOES

Varieties

Varieties ¹	DE	MD	NJ	PA	VA	WV	Table Stock	Chipping	Yield	Spacing
Early										
Andover			N	P		WV	+++	+++	+	9-10
Michigan Purple (purple skin)				P			++	No	++	8-10
Dark Red Norland D	D		N	P	V	WV	++	No	+	8-10
Superior (SR,VS)	D	M	N	P	V	WV	+++	+	++	8-12
Midseason										
Atlantic ²	D	M	N	P	V	WV	No	+++	+++	7-9
Chieftain (red skin)				P			++	No	++	7-9
Eva	D			P			++	++	++	8-10
Harley Blackwell	D		N				++	+++	++	9-12
Kanona				P			++	++	++	8-10
King Harry (for organic production)			N				++	--	++	8-10
Kueka Gold (pale yellow flesh)				P			++	+	+++	9-10
NorDonna (red skin)(trial)				P	V		++	No	++	9-12
Norkotah Russet	D		N	P	V		++	No	+	9-12
NYE 11-45				P			+++	+++	+++	9-10
Peter Wilcox (purple skin/yellow flesh)			N				++	No	++	8-10
Reba ³	D		N	P	V		+++	++	++	7-9
Yukon Gold ³ (yellow flesh)	D		N	P	V	WV	+++	No	++	8-10
Late										
Katahdin (LR)	D	M	N	P		WV	++	No	+++	8-10
Kennebec (VS,LBT)(not for eastern Virginia)		M		P	V	WV	++	No	+++	7-10
Lehigh (trial yellow flesh)			N	P			+++	++	+++	8-10
Marcy (NY112)	D		N				++	+++	+++	7-9
Norwis (EBR)(slight yellow flesh)	D		N	P			++	++	+++	7-9
Snowden	D		N	P	V	WV	No	+++	++	8-10

+ = fair ++ = good +++ = excellent

¹ Varieties are listed alphabetically within maturity group.

² Tubers of the chipping variety "Atlantic" are extremely susceptible to internal necrosis and hollow heart.

³ Tubers of "Reba" and "Yukon Gold" are susceptible to hollow heart during cool growing seasons. Apply one-third of the nitrogen at planting and sidedress the remainder when plants are 4 to 6 inches high to help reduce hollow heart.

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.

White Potatoes	Nitrogen (N) Pounds per Acre	Soil Phosphorus Level			Soil Potassium Level		
		Low	Med	Opt.	Low	Med	Opt.
		Pounds P ₂ O ₅ per Acre			Pounds K ₂ O per Acre		
Sandy loams and Loamy sands	150 ¹ 50 ² 100 ⁴	200 ¹ 200 ² 0	150 ¹ 150 ² 0	100 ¹ 100 ² 0	300 ¹ 300 ² 0	200 ¹ 200 ² 0	100 ¹ 100 ² 0
Loams and silt loams	125-150 ¹ 50 ² 75-100 ³	200 ¹ 100 ² 100 ³	150 ¹ 100 ² 50 ³	100 ¹ 0 100 ³	300 ¹ 200 ² 100 ³	200 ¹ 100 ² 100 ³	100 ¹ 0 100 ³

¹ Total amount nutrient recommended

² Broadcast and disk-in

³ Band place with planter

⁴ Sidedress 4-5 weeks after planting

Note: Additions of 30 pounds of P₂O₅ and K₂O may be applied to replace nutrients removed by the crop when soil test levels are above optimum (high).

Apply 1 pound of boron (B) per acre if soil test for B is low.

Planting and Spacing

The recommended planting dates for potatoes are March 10 to April 5 in Maryland and Virginia, March 20 to April 15 in Delaware, and March 20 to April 25 in New Jersey. In Pennsylvania, the recommended planting dates are March 25 to June 5.

Space seed 7 to 12 inches apart in 34- or 36-inch rows. Use close spacing for large, cut seed pieces and wider spacing for whole (B-size) seed. Use close spacing for to be potatoes marketed in 5 and 10-pound consumer packs and for ‘Katahdin’ and ‘Kennebec’, which tend to set few tubers and produce oversize tubers.

Seed-Piece Treatment

Use certified seed. Give seed potatoes a warming-up (65° to 70°F [18.3° to 21.1°C]) period of 2 to 3 weeks before planting to encourage rapid emergence. Plant seed pieces immediately after cutting or store under conditions suitable for rapid healing of the cut surfaces (60° to 70°F [15.6° to 21.1°C] plus high humidity). Dust seed pieces immediately after cutting. Some fungicide seed-piece treatments are formulated with fir or alder bark. Bark formulations have been effective treatments. Use one of the following:

For *Fusarium spp.*:

Captan--1.0 lb 7.5D/cwt or OLF, or
maneb*--1.0 lb 8D/cwt or OLF, or
Polyram--1.0 lb 7D/cwt or OLF

For *Fusarium spp. and Rhizoctonia spp.*:

Maxim--0.5 lb 0.5D/cwt, or
Maxim MZ*--0.5 lb/cwt
MonCoat MZ*--0.75-1.0 lb 7.5D/cwt, or
Tops--1.0 lb 2.5D/cwt, or
Tops MZ*--0.75-1.0 lb 8.5 D/cwt, or

Evolve* (thiophante-methyl, mancozeb and cymoxanil)--0.75 lb/cwt

For aphids, Colorado potato beetle, flea beetle and potato leafhopper:

Cruiser 5FS--see label for application directions and rates,
or

Tops MZ Gaucho--12.0 oz/cwt

*Seed-piece fungicides that contain EBDC fungicides or cymoxanil also provide protection against seedborne late blight infections.

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.

Apply postemergence herbicides when crop and weeds are within the recommended size and/or leaf stage.

Glyphosate--1.5-3.75 lb acid equivalent/A. Apply 3.2 to 8.1 pints per acre Roundup Ultra Max 4SC, 4 to 10 pints per acre Touchdown or 4 to 10 pints per acre Glyphomax Plus in the fall after harvest to control perennial grasses and broadleaf weeds, including quackgrass, field bindweed, Canada thistle, and others. Delay application after harvest to allow for adequate weed regrowth to intercept the spray. Apply before frost to weeds with cold-sensitive foliage. Do not till or mow for 1 week after application. Consult the label for additional details and the rate to use for each weed species.

Preemergence/Drag-Off

EPTC--3-4.5 lb/A. Apply 3.4 to 5.1 pints per acre Eptam 7E or 30 to 45 pounds per acre of Eptam 10G at one of the times listed below.

1. Just before planting and disking. This treatment is best for early season control of nutsedge and other weeds, but on plantings before April 1, it may reduce early vigor and yields slightly.
2. Just after "dragging off." Incorporate into soil in one or two cultivations with a spiketooth harrow or similar piece of equipment.
3. Just before first or second cultivation. This treatment is best for late-season control of nutsedge and other weeds. Do not apply within 45 days of harvest.

Primarily controls annual grasses, yellow nutsedge, and a few broadleaf weeds. Use linuron or metribuzin according to recommendations after planting to increase the spectrum of broadleaf weeds controlled.

Linuron--0.4-1 lb/A. Apply 0.8 to 2 pounds per acre Lorox 50DF (or OLF) after planting or before potatoes emerge, but after final drag-off and before grasses are 2 inches tall and broadleaf weeds are 6 inches tall. Primarily controls broadleaf weeds. Tank-mix with Dual Magnum or Prowl, or use in addition to Eptam for preemergence annual grass control. Use lower rates if tank-mixed. Do not plant to crops not on the label for 4 months after treatment.

S-metolachlor--0.96-1.91 lb/A. Apply 1 to 2 pints per acre Dual Magnum 7.62E or Dual II Magnum 7.64E before potatoes emerge, but after final drag-off. Dual Magnum will primarily control annual grasses. Nutsedge (nutgrass,

coffeegrass) control may be adequate if weed pressure is light. Tank-mix Dual Magnum with linuron or metribuzin for broadleaf weed control. A jug-mix of Dual Magnum and Sencor that is labeled for use in white potatoes is sold under the trade name Boundary. **Other generic versions of metolachlor and s-metolachlor may be available, and may or may not be labeled for use in the crop.**

Metribuzin--0.38-0.5 lb/A. Apply 0.5 to 0.66 pound per acre Sencor/Lexone 75DF (or OLF) (use comparable rates of liquid) just prior to emergence. If drag-off is practiced, then the application should be made after drag-off. Primarily controls broadleaf weeds. Tank-mix with Dual Magnum or Prowl, or use in addition to Eptam for preemergence annual grass control. Read label for rotation crop restrictions. A jug-mix of Dual Magnum and Sencor that is labeled for use in white potatoes is sold under the trade name Boundary. Do not apply within 60 days of harvest.

Note. Preemergence application to 'Atlantic' and 'Norland' or to any early maturing, smooth, white- or red-skinned potato varieties, may cause crop injury, especially under adverse weather conditions and when higher labeled rates are used.

Pendimethalin--0.48-1.42 lb/A. Apply 1 to 3 pints per acre Prowl H₂O before potatoes emerge. Prowl primarily controls certain broadleaf weeds, including velvetleaf and early-season annual grasses, but does not control yellow nutsedge. Combine with Lorox to improve velvetleaf control, or with linuron or metribuzin to improve the control of most other broadleaf weeds.

Postemergence

Rimsulfuron--0.0156 lb/A. Apply 1 ounce per acre Matrix 25DF early postemergence to control many weeds including foxtail species, pigweed species, wild mustard, and wild radish. Common lambsquarter, common ragweed, jimsonweed, morningglory species, and yellow nutsedge may only be suppressed. Tank-mix with reduced rates of metribuzin, following label instructions, to increase the spectrum of weeds controlled. Repeat the application 2 to 4 weeks after the initial spray to improve the suppression or control of common purslane and perennial weeds, such as field and hedge bindweed. Results may be most effective when used following a preemergence residual weed control program. Add nonionic surfactant to be 0.25 percent of the spray solution (1 quart per 100 gallons of spray solution) to improve weed control. DO NOT exceed 2 ounces of Matrix 25DF per acre per year.

Rimsulfuron (Matrix 25DF) is an ALS inhibitor. Herbicides in this class have a single site of action in susceptible plants. Always use in combination with other herbicides with a different site of action in the plant to prevent the development of resistant weed populations. Read and follow label cautions and resistance management recommendations.

S-metolachlor--1.6 lb/A. Apply 1.67 pints Dual Magnum 7.62E as a directed spray after hilling/at lay-by to provide preemergence control of sensitive weeds for the remainder of the growing season. Emerged weeds will not be controlled. This treatment may be applied in addition to a previous (drag-off) application of Dual Magnum or Dual II Magnum, but do not apply more than 3.6 pints Dual Magnum per acre in one season. Maintain a 40-day preharvest interval between the after hilling/at lay-by application of Dual Magnum and

harvest. **Other generic versions of metolachlor and s-metolachlor may be available, and may or may not be labeled for use in the crop.**

Metribuzin--0.25-0.5 lb/A. Apply 0.33 to 0.66 pound per acre Lexone/Sencor 75DF (or OLF) before weeds are 1 inch tall. Primarily controls broadleaf weeds. Apply only if there have been at least three successive sunny days prior to application. Do not use on red-skinned or early maturing, smooth, white-skinned varieties. Treatment may cause some yellowing or minor burn. Read label for soil texture, crop rotation, and varietal restrictions.

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 30 days.

Sethoxydim--0.2-0.4 lb/A. Apply 1 to 2 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 5 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 for postharvest desiccation of the crop in Delaware, New Jersey and Virginia.** Apply 2.4 pints per acre Gramoxone Inteon 2SC 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.org or www.Greenbook.org. Also, specific labels can be obtained via web search engines.

Wireworms (Also see Chapter E "Wireworms" section in Soil Pests--Their Detection and Control.)

Preplant Application

ethoprop (Mocap 6EC or OLF). Broadcast and incorporate just before planting.

Note: A special local needs label (24-C) is in effect in Delaware for the use of diazinon on white potatoes as a preplant broadcast application for the control of wireworms.

Planting Application

bifenthrin (Brigade EC, Sniper or OLF)
ethoprop (Mocap 6EC or OLF)
fipronil (Regent 4SC)
phorate (Thimet 20G)

Lay-by Application

bifenthrin (Brigade EC, Sniper or OLF)

Foliar Application (for control of the adult stage of wireworms)

bifenthrin (Brigade EC, Sniper or OLF)

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

Cutworms are present during July and August. They are especially troublesome to tubers where soil cracking occurs. Variegated cutworms feed on lower leaves and petioles, and protective sprays should be applied if numbers exceed six worms per plant or foliar loss is more than 10 percent. Black cutworms are largely underground feeders, but will occasionally feed on leaves. No materials are effective if larvae do not feed aboveground (foliar and systemic insecticides are ineffective). Several spray applications may be required for control.

beta-cyfluthrin (Baythroid XL)
carbaryl (Sevin 5%Bait, Sevin 80S or OLF)
esfenvalerate (Asana XL)
lambda-cyhalothrin(Lambda-cy, LambdaT, Silencer, Warrior, Warrior II or OLF)
methomyl (Lannate LV or OLF) (**variegated cutworm only**)
permethrin (Perm-Up, Pounce 3.2EC or OLF)
cyfluthrin (Renounce 20WP, Tombstone or OLF)

Colorado Potato Beetle (CPB)

Pesticide Resistance Management

Do not rely exclusively on the neonicotinoid class of insecticides (Class 4: Actara, Assail, Cruiser, Gaucho, imidacloprid, Platinum or Venom) for CPB control. It is important to use all available effective pest management strategies, including crop rotation, pest scouting, treatment thresholds, and alternative (different class) insecticides, such as abamectin, Avaunt plus PBO, cryolite, Entrust, Rimon, SpinTor, Thionex or Vydate.

For rotated fields adjacent to beetle overwintering sites or contiguous to previous year's potato fields, most of the colonizing adults can be killed by treating only a strip of rows

along the field edge where the invasion front is expected. Fields should still be monitored for beetles and other insect pests throughout the season.

Preplant or Planting Application

imidacloprid (seed treatment only-Gaucho Tops; seed-piece application, in-furrow or side-dress application-Admire PRO)

dinotefuron (Venom 70SG or OLF)

thiamethoxam (seed treatment only-Cruiser 5SF; in-furrow application-Platinum 2SG)

Postemergence Application

Rotation to nonsolanaceous crops (crops other than potato, tomato, eggplant, and pepper) is extremely important in reducing CPB problems. The further you can plant your fields from last year's solanaceous crop, the more beneficial it will be to reducing CPB problems. Avoid the application of late-season sprays to prevent the buildup of insecticide-resistant beetles.

Beginning at plant emergence, sample fields weekly for CPB to determine the need to spray. Select at least 10 sites per field along a V- or W-shaped path throughout the field. At each site, select one stem from each of five adjacent plants and count and record all adults, large larvae (more than half-grown), and small larvae (less than half-grown). As a general guideline, if more than 50 adults or 75 large larvae or 200 small larvae are counted per 50 stems, a treatment is recommended. The amount of yield loss as a result of CPB feeding depends on the age of the potato plant. 'Superior' variety (short season) cannot compensate for early season defoliation by overwintered beetles, but during the last 30 days of the season, 'Superior' can withstand up to 50 percent defoliation without yield loss.

Note: Several of these insecticides may no longer be effective in certain areas due to CPB resistance. Check with your county Extension agent for most effective control.

abamectin (Agri-mek EC, Abba EC, Temprano or OLF)

acetamiprid (Assail 30SG or OLF)

azadirachtin (Azatin, Ecozin, Neemix or OLF)

Bacillus thuringiensis tenebrionis (Novodor- **Small CPB larvae only**). Make first application when eggs begin to hatch and repeat applications at 5- to 7-day intervals if small larvae are present. NOT effective against large larvae and adults. If rainfall occurs within 24 hours posttreatment, reapplication may be necessary. Larval reduction may not be noticeable for 48 to 72 hours after application.

chlorantraniliprole (Altacor 35WDG)

cryolite (Kryocide 96WP, Prokill Cryolite 96)

cyromazine (Trigard 75WP)

dinotefuron (Venom 70SG or OLF)

endosulfan (Thionex 3EC or OLF)

imidacloprid (Nuprid 1.6F, Provado 1.6F or OLF)

indoxacarb (Avaunt 30WDG, **larvae only**). The addition of the synergist piperonyl butoxide (PBO) is necessary when using indoxacarb. Apply when pests first appear and are in their early larval stages.

novoluron (Rimon 0.83EC)

oxamyl (Vydale L)

phosmet (Imidan 50WP)

spinetoram (Radiant 2SC)

spinosad (Entrust 80W, SpinTor 2SC or OLF)

thiamethoxam (Actara 25WDG)

Note: DO NOT use foliar applications of any neonicotinoid insecticide (imidacloprid, thiamethoxam, dinotefuron, acetamiprid) in fields previously treated with at-planting neonicotinoids.

Flea Beetles (FB), Potato Leafhoppers (PLH)

Monitor fields for the buildup of leafhoppers from early June until early August. Treatment is suggested if leafhopper counts exceed 1 adult per sweep or 1 nymph per 10 leaves.

- acetamiprid (Assail 30SG or OLF)
- beta-cyfluthrin (Baythroid XL)
- bifenthrin (Brigade EC, Sniper or OLF)
- carbofuran (Furadan 4F)
- cyfluthrin (Renounce 20WP, Tombstone or OLF)
- dimethoate (Dimate 4EC or OLF)
- dinotefuron (Venom 70SG or OLF)
- endosulfan (Thionex 3EC or OLF)
- esfenvalerate (Asana XL)
- imidacloprid (soil-Admire 2F; seed-piece, in-furrow or side-dress-Admire PRO; foliar (**LH only**)-Nuprid 1.6F, Provado 1.6F or OLF)
- lambda-cyhalothrin (Lambda-cy, LambdaT, Silencer, Warrior, Warrior II or OLF)
- methamidaphos (Monitor 4E)
- methomyl (Lannate LV or OLF)
- methyl parathion, encapsulated (PennCap-M 2FM)
- oxamyl (Vydate 2L)
- permethrin (Perm-Up, Pounce 3.2EC or OLF)
- phosmet (Imidan 50WP)
- thiamethoxam (soil-Platinum 2SG; foliar-Actara 25WDG)

European Corn Borer (ECB)

Proper timing of ECB sprays is critical. Apply first spray when 10% of the stems have entry holes in fresh market varieties or 25% in processing varieties. Make two to three applications on a 5- to 10-day schedule. Consult your county Extension agent and/or area pest management newsletter.

- beta-cyfluthrin (Baythroid XL)
- carbofuran (Furadan 4F)
- chlorantraniliprole (Altacor 35WDG)
- cyfluthrin (Renounce WP, Tombstone or OLF)
- esfenvalerate (Asana XL)
- indoxacarb (Avaunt 30WDG)
- lambda-cyhalothrin (Lambda-cy, LambdaT, Silencer, Warrior, Warrior II or OLF)
- methamidaphos (Monitor 4E)
- methyl parathion, encapsulated (PennCap-M 2FM)
- novoluron (Rimon 0.83EC)
- spinetoram (Radiant 2SC)
- spinosad (Entrust 80W, SpinTor 2SC or OLF)

Note: If a pyrethroid is used for ECB control, make first application when 8 to 10 ECB moths are being trapped in local pheromone or blacklight traps. Apply two to three additional applications at 5- to 7-day intervals, based on moth activity.

- esfenvalerate (Asana XL)
- permethrin (Perm-Up, Pounce 3.2EC or OLF)

Aphids

Insecticide treatments are recommended when aphid counts exceed 2 per leaf prior to bloom, 4 aphids per leaf

during bloom, and 10 aphids per leaf within 2 weeks of vine kill.

- acetamiprid (Assail 30SG or OLF)
- dimethoate (Dimate 4EC or OLF)
- dinotefuron (Venom 70SG or OLF)
- endosulfan (Thionex 3EC or OLF)
- flonicamid (Beleaf 50SG)
- imidacloprid (soil-Admire 2F; seed piece, in-furrow, side-dress-Admire PRO; foliar-Nuprid 1.6F, Provado 1.6F or OLF)
- methamidaphos (Monitor 4E)
- methomyl (Lannate LV or OLF)
- oxamyl (Vydate L)
- pymetrozine (Fulfill 50WDG)
- spirotetramat (Movento)
- thiamethoxam (soil-Platinum 2SG; foliar-Actara 25WDG)

Potato Tuberworm

Note: Treat when foliage injury is first noted. Four to five applications at 7- to 14-day intervals may be needed. Tuberworms are primarily a problem on the fall crop.

Because moths are actively flying at dusk, sprays are most effective when applied early evening.

- beta-cyfluthrin (Baythroid XL)
- cyfluthrin (Renounce 20WP, Tombstone or OLF)
- esfenvalerate (Asana XL)
- lambda-cyhalothrin (Lambda-cy, LambdaT, Silencer, Warrior, Warrior II or OLF)
- methamidaphos (Monitor 4E)
- methomyl (Lannate LV or OLF)
- novoluron (Rimon 0.83EC)
- permethrin (Perm-Up, Pounce 3.2EC or OLF)

Pesticide	Use Category ¹	Hours to Reentry ²	Days to Harvest ^{3,4,5}
INSECTICIDE			
abamectin	R	12	14
acetamiprid	G	12	7
azadirachtin	G	4	0
<i>Bacillus thuringiensis</i>	G	4	0
beta-cyfluthrin	R	12	0
carbaryl/carbaryl bait	G	12	7
bifenthrin	R	12	21
carbofuran	R	48	14
chlorantraniliprole	G	4	14
cryolite	G	12	0
cyfluthrin	R	12	0
cyromazine	G	12	7
dimethoate	R(NJ),G	48	7
dinotefuron (soil)	G	12	PP ⁵
(foliar)			7
endosulfan	R	24	1
esfenvalerate	R	12	7
ethoprop	R	48	AP ⁴
fipronil	R	0	90
flonicamid	G	12	7
imidacloprid (seed treatment)	G	12	AP ⁴
(soil/foliar)	G	12	AP/7
indoxacarb	G	12	7
lambda-cyhalothrin	R	24	7
methamidaphos	R	48	14
methomyl	R	48	6

(table continued next page)

Pesticide (continued)	Use Category ¹	Hours to Reentry ²	Days to Harvest ^{3,4,5}
INSECTICIDE			
methyl parathion, encapsulated	R	5 days	5
novoluron	G	12	14
oxamyl	R	48	7
permethrin	R	12	14
phorate	R	48	90
phosmet	G	24	7
pymetrozine	G	12	14
spinetoram	G	4	7
spinosad	G	4	7
spirotetremat	G	24	7
thiamethoxam (seed treatment)	G	12	AP ⁴
thiamethoxam (soil/foliar)	G	12	30/14
FUNGICIDE (FRAC code)			
Blocker (Group 14)	G	12	AP ⁴
chlorothalonil (Group M5)	G	12	0
Curzate (Group 27)	G	12	14
Endura (Group 7)	G	12	30
Flouronil (Groups 4 + M5)	G	48	14
Forum (Group 40)	G	12	4
Gavel (Groups 22 + M3)	G	48	14/3 ³
Gem (Group 11)	G	12	7
Headline (Group 11)	G	12	3
iprodione (Group 2)	G	12	14
mancozeb (Group M3)	G	12,24	14/3 ³
Moncut (Group 7)	G	12	AP ⁴
Omega (Group 29)	G	48	14
Polyram (Group M3)	G	24	14/3 ³
Previcur Flex (Group 28)	G	12	14
Quadris (Group 11)	G	4	14
Quadris Opti (Groups 11 + M5)	G	12	14
Ranman (Group 21)	G	12	7
Reason (Group 11)	G	12	14
Ridomil Gold Bravo (Groups 4 + M5)	G	48	7
Ridomil Gold Copper (Group 4 + M1)	G	48	7
Ridomil Gold MZ (Groups 4 + M3)	G	24	14/3 ³
Super Tin (Group 30)	G	24,48	21
Tanos (Groups 11 + 27)	G	12	14
thiophanate-methyl (Group 1)	G	12	14
Ultra Flourish (Group 4)	G	48	0

See Table D-6.

¹ G = general, R = restricted

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

³ 14 days = NJ, MD, VA; 3 days = DE, PA

⁴ AP = At Plant

⁵ PP = Preplant

Nematode Control

See Section E, "Nematodes" section in Soil Pests--Their Detection and Control. Use fumigants listed in the "Soil Fumigation" section, or use the following:

Mocap--20 lb 15G/A or OLF. Apply in a 12-inch band on the row at planting (avoid contact with seed piece).

Disease Control

Air Pollution

Symptoms appear as tiny spots of brown tissue on the upper surface of leaves and a bronzing of the lower surfaces.

Some varieties such as Kanona, Red Norland, and Snowden are particularly sensitive.

Early Blight

Begin sprays in mid-June and continue every 7 to 10 days or apply fungicides according to a disease forecasting system. If late blight is a threat, then begin sprays when plants are 8 inches tall. Gem, Headline and Quadris, are particularly effective on early blight susceptible varieties.

Alternate one of the following fungicide programs:

chlorothalonil--1.0-1.5 pt 6F/A or OLF, or
 Endura--2.5-4.5 oz 70WG/A, or
 mancozeb--1.5-2.0 lb 75DF/A or OLF (**Note: DO NOT apply more than a total of 15 pounds of mancozeb or Polyram per acre per crop**), or
 Polyram--2.0 lb 80DF/A or OLF (**Note: DO NOT apply more than a total of 15 pounds of mancozeb or Polyram per acre per crop**), or
 Super Tin--6.0 fl oz 4L/A or OLF *plus* mancozeb--2.0 lb 75DF/A or OLF

With one of the following FRAC code 11 fungicides:

Quadris--6.0-15.5 fl oz 2.08SC/A, or
 Gem--6.0-8.0 oz 25WDG/A, or
 Headline--6.0-9.0 fl oz 2.1F/A, or
 Quadris Opti--1.6 pt/A, or
 Reason--5.5-8.2 fl oz 500SC/A

Late Blight

Begin fungicide applications when plants are 6 inches tall and repeat every 7 days or apply fungicides according to a disease forecasting system such as BLITECAST or WISDOM. The following protective fungicides should be applied early in the season prior to the occurrence of any disease in the region:

chlorothalonil--1.0-1.5 pt 6F/A or OLF, or
 mancozeb--1.5-2.0 lb 75DF/A or OLF. (**Note. DO NOT apply more than a total of 15 pounds per acre per crop**), or
 Polyram--2.0 lb 80DF/A or OLF. (**Note. DO NOT apply more than a total of 15 pounds per acre per crop**).

The following fungicides can be used when the threat of the disease is high or present in the area and protectant fungicides have been used prior to disease occurrence:

Curzate--3.33 oz 60DF/A plus a protectant fungicide (ie, chlorothalonil or mancozeb), or
 Forum--4.0-6.0 fl oz 4.18SC/A plus a protectant fungicide, or
 Gavel--1.5-2.0 lb 75DF/A, or
 Headline--6.0-9.0 oz 2.1F/A, or
 Omega--5.5 fl oz. 500F/A, or
 Previcur Flex--1.2 pt 6F/A plus a protectant fungicide (ie, chlorothalonil or mancozeb), or
 Ranman--1.4-2.75 fl oz 400SC/A, or
 Tanos--8.0 oz 50W/A *plus* a protectant fungicide (ie, chlorothalonil or mancozeb)

When a field contains new late blight infections and harvest is near, vines should be killed immediately to help prevent tuber infection.

Rhizoctonia stem canker and black scurf

Apply one of the following as an in-furrow spray at planting:

Quadris--0.4-0.6 fl oz 2.08SC 1,000 ft of row , or

Moncut--0.71-1.1 lb 70DF/A, or
Blocker--5.2--10.0 fl. oz 4F/1,000 ft row

Verticillium Wilt

Select fields with a low incidence of wilt. Use resistant varieties where possible. Do not use tomato, eggplant, or pepper in rotation with potato. The use of sudangrass in rotation with potato may reduce nematode levels. The use of Mocap (see "Nematode Control" section) will reduce lesion nematode levels in the soil, resulting in less Verticillium wilt.

Apply one of the following through center pivot irrigation in the fall to fallow fields for suppression of Verticillium and lesion nematode:

K-Pam HL--30.0-60.0 gal/A, or
metam-sodium (Vapam HL)--37.5-70.0 gal/A

White Mold

Apply the following immediately prior to row closing and repeat 28 days later:

Endura--5.5-10.0 oz 70WG/A, or
Omega--5.5-8.0 fl oz 500F/A, or
iprodisone--2.0 pt 4F/A or OLF, or
thiophanate-methyl--1.0--1.5 lb 70WP/A

Common Scab

Use resistant varieties and rotate with green cover crops.

Bacterial Soft Rot

Prevent wounding and make certain tubers are dry before packing. Free chlorine wash maintained at 25 ppm or use of a fresh chlorine rinse maintained at 50 ppm may help reduce soft rot.

Leak (Pythium) and Pink Rot (Phytophthora)

Leak is a disease that usually enters the tubers through bruises occurring in conjunction with the harvesting of immature tubers during hot weather. Pink rot generally occurs in poorly drained areas. Be sure to rotate out of potatoes for at least 2 years. Apply one of the following fungicides with as much gallonage as possible. Make three applications of one of the following fungicides. The first application should be made at nickel size tubers. The second and third applications should occur 14 and 28 days later. Be sure to get some coverage of the soil surrounding plants for root uptake to occur.

mefenoxam chlorothalonil (Ridomil Gold Bravo, Fluoronil)--
2.0 lb 76WP/A, or
Ridomil Gold Copper--2.0 lb 65WP/A, or
Ridomil Gold MZ--2.5 lb 68WP/A

An alternative application technique is to apply one of the following in a 6- to 8-inch band directly over the seed-piece prior to row closure:

Platinum Ridomil Gold--2.2 fl oz 1.6E/1000 feet of row, or
Ridomil Gold--0.42 fl oz 4EC/1,000 feet of row, or
Ultra Flourish--0.84 fl oz 2E/1,000 feet of row, or
Ranman--0.42 fl. oz/1,000 ft row

Vine Killing

Potato vines are frequently killed prior to harvest. Vine desiccation facilitates harvest by reducing excessive potato foliage or weed growth. In early harvests, vine desiccation can hasten or improve skin set on relatively immature potatoes, thus reducing tuber damage during grading, packing and shipping. Proper skin set of the potato

improves shelf life, assists with retention of potato quality during transport and improves eye appeal. Also, market demand for smaller (B-size) potatoes of some varieties may be greater for mid-size tubers than for large tubers and continued tuber sizing soon stops following vine desiccation. Decisions as to when to apply vine desiccants must be based on intended market, demand for a given size and the need for high quality, non-skinned tubers.

Diquat--0.25 to 0.5 lb/A. Apply 1.0 to 2.0 pts/A of Reglone for preharvest vine desiccation in a minimum of 20 gallons of water per acre by ground application. Add a non-ionic surfactant (NIS) containing 75% or greater surface active agent at 0.25 to .05% v/v (1.0 to 2.0 qts/100 gals) of the finished spray volume. Rainfall 30 minutes following application will not affect the activity of Reglone. Do not apply to drought stressed potatoes. A second application may be made if necessary in dense vine growth. Do not exceed a total of 4 pts/A of Reglone. If two applications are made, allow at least 5 days between applications.

Glufosinate-ammonium--0.38lb/A. Apply 3.0 pt/A Rely at the beginning of natural vine senescence in a single application. Potatoes with heavy or dense vines may require an application of another desiccant (diquat) to complete vine desiccation. Thorough coverage of vines is essential for satisfactory results. Do not harvest potatoes within 9 days of Rely application nor apply to potatoes grown for seed. Do not plant treated areas to wheat, barley, buckwheat, millet, oats, rye, sorghum or triticale until 30 or more days after Rely application.

Sprout Inhibitors

Apply the following directly to tubers:

Chloroprotham--1% Solution. Apply Sprout Nip 3EC as a 1% solution (1 gallon of Sprout Nip per 35 gallons of water) on the drying table after potatoes have been washed. The spray nozzle should be set to spray evenly across the rollers moving the potatoes. The spray solution should be applied at the rate of 1 quart of the 1% solution per 2000 pounds (20 cwt bags) of potatoes. Rollers will distribute the spray solution and assure complete coverage of each potato. **Note: Other formulations of Sprout Nip are available.**

Maleic hydrazide (MH-30 SG). Apply to crop 2-3 weeks after full bloom or when harvestable tubers are at least 1.5" in diameter. Do not apply when the temperature is expected to exceed 80°F (26.6°C) that day. Read the label carefully and follow the labeled rate.

Storage

Vines of potatoes going into storage should be completely dead at least 14 to 21 days before harvest. Healing of cuts and bruises is most rapid at a tuber temperature of 50° to 60°F (10° to 15.6°C) and a relative humidity of 90 to 95%, but no free water. This temperature should be provided for 2 to 3 weeks at the beginning of the storage period. After this, the temperature should be lowered to 40°F (4.44°C) for table stock or seed potatoes. Where a "rot potential" such as field frost, late blight, or soft rot is present, the curing period should be eliminated, and the temperatures lowered to 45°F (7.22°C) as soon as possible with increased air flow. Monitor the storage daily and if the rot continues the crop should be sold.