

University of Delaware Cooperative Extension, Rutgers Cooperative Extension

Compiled by J.M. Whalen, M.P. Spellman W.L. Kline & S.T. Kline

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POTATO (WHITE) IPM FIELD GUIDE

Pre-planting Decisions

1. Maintain a minimum 3 year rotation for control of soilborne diseases. Avoid planting potatoes in fields adjacent to previous season's host crops (tomatoes or eggplant) to reduce problems with overwintering Colorado Potato Beetle (CPB) and early blight. A distance of 1/4 to 1/2 mile is best, but an intervening field of winter wheat or hay will prevent or slow movement of CPB from a host crop field into this year's potatoes. (378, 411) *
2. Avoid land that is poorly drained or heavily infested with soilborne pathogens. ((161)
3. Dispose of cull piles.
4. Plant only high quality certified seed potatoes and select disease resistant cultivars. (161)
5. Handle and plant seed tubers properly.
6. Provide balanced fertility. Avoid excess nitrogen. Lime and fertilize according to soil test recommendations. (161, 1584)
7. Obtain access to weather station information for late blight forecasts.
8. Identify the weeds in each field and select recommended controls for those weeds. Map perennial or noxious weeds. Match preplant incorporated and preemergence herbicide rates to soil type and percent organic matter in each field. (292)

Plant Emergence to 12 Inch Shoots (Prebloom)

Recommended Scouting Pattern: For ≤ 50 acre fields, scout in a V shape pattern, making 5 random stops along each side of the V, sampling 5 stems per stop. A more thorough method is to scout in W pattern, making 50 stops along the W, examine 1 stem per stop. A typical seed potato produces a hill of 2 to 5 stems. Select one of these stems, not side branches. (411) Larger fields may require additional scouting locations. If late blight is present in the field, wear disposable coveralls and wash boots with a sodium hypochlorite (Clorox, Purex, etc.) solution. Scout known late blight fields last, if possible.

PEST	Damaging Stage	Monitored Stage	SAMPLING		THERSHOLD	NOTES
			Method	Frequency		
Flea Beetle (798, 381)	adult	adult	If small round holes are present in the leaves, take 10 sweeps in 10 locations.	2x per week	2 or more beetles/sweep and defoliation greater than 20%	Damage will appear as small round holes in leaves.
Overwintered Colorado Potato Beetle (CPB) (80, 232)	adult	adult	Check field edges for movement of adults from nearby fields planted to host crops the previous season.	2x per week	5 adult beetles per 10 plants and greater than 10% defoliation	Consider flaming, trapping CPB with plastic lined trenches and other options to reduce the possibility of insecticide resistance. (411, 439, 481, 483, 484, 485, 486, 489, 606)
Potato Leafhopper (10)	adult nymph	adult nymph	While sampling for CPB, take 10 sweeps from 5 random sites and count adults.	every 5- 7 days	1 adult/sweep or 1 nymph/10 leaves.(292) NJ: 25 adults/50 sweeps (426) Pennsylvania: $\geq 5/50$ stems (411)	Begin when leafhopper adults are first active in alfalfa or when adults are noticed jumping from foliage while sampling for other pests.

Pest	Damaging Stage	Monitored Stage	Sampling		Threshold	Notes
			Method	Frequency		
Colorado Potato Beetle (CPB) (80, 232)	adult larval	adult larval egg	Sample as outlined above. # of CPB/50 plant sample adults sm.larvae lg.larvae low 0-15 0-75 0-30 med. 16-24 76-199 31-74 high ≥ 25 ≥ 200 ≥ 75	every 5-7 days	Standard Insecticides: High level of any one stage OR Medium level of two life stages Bt Insecticides: 8 egg masses/50 plants + 25% of egg masses are hatching.	Small larvae = 1st & 2nd instars Large larvae = 3rd & 4th instars A defoliation threshold of 20% should also be considered for the variety 'Superior'.
Green Peach Aphid (GPA) Potato Aphid (PA) (50, 611)	all	all	Sample 5 leaves from 5 randomly selected plants in 10 locations. Select leaves randomly from the entire plant	every 5-7 days	DE, MD, NJ = average of 2 per leaf Pennsylvania = 90 GPA/50 leaves	GPA are light green to rose, with cornicles the same color as the body and dark only near the tip. Within a colony, color variation among individuals is minimal compared with the variation among melon aphids.
Melon Aphid (419)	all	all	Sample 5 leaves from 5 randomly selected plants in 10 locations. Select leaves randomly from the entire plant.	every 5-7 days	1 per leaf	Melon aphids can be distinguished from GPA by their smaller size, generally darker colors and dark and short cornicles or "tail pipes".

Disease	Sampling	Frequency	Threshold	Notes
Early Blight (78, 411, 498, 779)	Start looking for symptoms a week after hilling if growing a susceptible variety such as 'Norchip', 'Norland', 'Monona', Superior, etc.. Sample 5 plants in 10 random locations looking for brown, target shaped lesions with yellow halos on older leaves.	every 5-7 days	presence of disease	Once symptoms appear on susceptible varieties, apply controls weekly unless there has been no rain the previous week and temperatures $\geq 80^{\circ}\text{F}$. (411)
Late Blight (76, 288, 498, 657, 1084)	Scout low lying areas, field edges along creeks, ponds or woods, near center pivot and areas where leaves remain wet for long periods of time. Look for large, black or purplish lesions on stems and leaves or white mold growth on undersides of foliage at leaf margins. Use disease prediction system.	every 5-7 days	18 severity units accumulation from "green row".	"Green row" = when you can stand at the end of the field and see a row.

Greater than 12 shoots (Bloom) to Harvest

Disease	Sampling	Frequency	Threshold	Notes
Early Blight (78, 411, 498, 779)	For varieties with some resistance to early blight ('Kennebec', 'Katahdin', 'Snowden', etc.) begin scouting for early blight. Sample 5 plants in 10 random locations looking for brown target shaped lesions with yellow halos on older leaves. (411)	every 5-7 days	presence of disease	For these varieties, begin control when disease has been found. For more susceptible varieties, begin control at blooming. Skip a treatment if there is no rain for a week and temperatures are $\geq 80^{\circ}\text{F}$. (411)

Greater than 12 shoots (Bloom) to Harvest, continued

Disease	Sampling	Frequency	Threshold	Notes
Late Blight (76, 288, 498, 657, 1084)	Scout low lying areas, field edges along creeks, ponds or woods or near center pivot irrigation. Look for large, black or purplish lesions on stems & leaves or white mold growth on undersides of foliage. Check area where leaves remain wet for long periods.	every 5-7 days	Use disease prediction system. Threshold is 18 severity units from "green row."	Green row is defined as when you can stand at the end of the field and see a row.

Pest	Damaging Stage	Monitored Stage	Sampling		Threshold	Notes
			Method	Frequency		
Melon Aphid (419)	all	all	Sample 5 leaves from 5 randomly selected plants in 10 locations. Select leaves randomly from the entire plant. Melon aphids are smaller than GPA, darker in color with dark & short cornicles.	every 5-7 days	1 per leaf	
Green Peach Aphid (GPA) Potato Aphid (PA) (50, 611)	all	all	Sample 5 leaves from mid to lower section of 5 plants in 10 locations. Look for plants with cupped or wrinkled leaves. GPA are light green to rose with cornicles the same color as the body; dark only near the tip. Within a colony, color variation among individuals is minimal compared with melon aphids. PA, the largest of the aphids = 1/8 in. Cornicles are 1/3 the length of the body.	every 5-7 days	Penn: Bloom: 240 GPA/50 leaves. Postbloom: 240 GPA/ 50 leaves for a russet variety 475 GPA/50 leaves for non-russet variety. DE/MD: Bloom: 4/leaf 2 weeks prior to vine kill: 10/leaf	
Colorado Potato Beetle (CPB) (80, 232)	adult larval	adult larval egg masses	Sample 5 plants in 10 random locations. Sm. Larvae = 1 st & 2 nd instars Lg. Larvae = 3 rd & 4 th instars # of CPB/50 plant sample Adults sm. Larvae lg.larvae low 0-15 0-75 0-30 med. 16-24 76-199 31-74 high ≥ 25 ≥ 200 ≥ 75	every 5-7 days	Standard Insecticides: High level of any one stage OR Medium level of two life stages Bt Insecticides: 8 egg masses/50 plants + 25% of egg masses are hatching.	During the last 30 days of the season, the variety 'Superior', can withstand up to 50% defoliation.
Potato Leafhopper (10)	adult nymph	adult nymph	10 sweeps in 10 locations for adults Random sample 5 plants in 10 locations for nymphs. Most critical time for control is at "bulking". The variety, 'Superior,' is more susceptible to leafhopper injury than other varieties.	every 5-7 days	Pennsylvania: ≥ 5/50 stems OR 0.5 adults/sweep + 0.1 nymphs/ leaf OR 0.5-1 adult/sweep + nymphs or adults present for > 2 weeks OR 1-1.5 adults/sweep + nymphs present OR >1.5 adults/sweep Treat: immediately if there are 1-1.5 adults/sweep + nymphs present. Treat within a week if no nymphs present.	

PEST	Damaging Stage	Monitored Stage	SAMPLING		THRESHOLD	NOTES
			Method	Frequency		
European Corn Borer (ECB) (113, 613)	larval	adult larval	When blacklight trap (BLT) catches reach 10 ECB/night, scout for entrance holes in leaf petioles, mid-ribs & upper nodes on main shoots.	every 5- 7 days	first treatment: 10% of terminal tips show one entrance hole in fresh market; 25% in processing potatoes. (292) second treatment: BLT catches >10 per night and terminal injury is increasing.	Treatment: A second treatment should be applied 7 - 10 days after the first if second treatment threshold is reached.

Contributors: Gerald M. Ghidui, Extension Specialist in Entomology and Stephen A. Johnston, Extension Specialist in Plant Pathology, Rutgers Agricultural Research & Extension Center, Bridgeton, NJ

***Bolded numbers in parenthesis indicate sources of additional information found in the Mid-Atlantic IPM Database by this special reference number.**

Scouting procedures, thresholds, and crop management recommendations have been compiled from a number of sources and may not be valid for all areas within the Mid-Atlantic Region. These field guides are meant to be used as guidelines. As such, they should be validated on a small acreage before relying on them. No guarantee of their validity, success, or failure to perform in the field is implied or expressed. Consult your local Cooperative Extension Agent for additional information or assistance.