

**University of Delaware Cooperative Extension, Rutgers Cooperative Extension**

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**SPINACH IPM FIELD GUIDE**

**Pre-planting Decisions:**

1. Site selection and crop rotation for disease management.
  - Three year rotation with non host crops (915)\*
  - Deep plow crop residues and avoid planting in fields adjacent to previous year’s spinach crop. (915)
2. Use resistant varieties for blight (MR) and other diseases. (292, 551)
3. Use a combination of cultural practices to reduce problems from seed corn maggot.
  - Plow down cover crops 3 to 4 weeks before planting.
  - Completely bury cover crops or previous crop residues to reduce adult fly attraction to rotting organic matter.
  - Reduce use of heavy manure applications and let age before incorporation.
  - Attach a set of drag chains behind planter to reduce moisture gradient.
  - During cool, wet conditions; use a broadcast insecticide application. (292)
4. Lime and fertilize according to soil test recommendations. (1584)
5. Use the information obtained from scouting weeds the previous year to select recommend control strategies for those weeds. Match preplant incorporated and preemergence herbicide rates to soil type (obtained by mechanical analysis) and percent organic matter in each field. (292)

**Spring Planted Spinach**

Pest	Damaging Stage	Monitored Stage	Sampling		Threshold	Notes
			Method	Frequency		
<b>Flea Beetles</b> (381, 915, 145)	adult larval (381)	adult	Monitor newly emerged plants for pitting or irregularly shaped holes. Pay particular attention to outside rows.	2 - 3 times per week	Several damaged rows.	<b>Treatment:</b> Spot treatment of outside rows can be effective in controlling flea beetles.
<b>Aphids</b> (145, 50)	all	all	Random sample 10 plants in 10 locations. Examine undersides of leaves & count # aphids.	weekly	<b>Seedlings:</b> 1 aphid/plant <b>Established plants:</b> 4-10 aphids/ plant	If population is localized, spot treat. Overuse of pyrethroids kill predators/ parasites that help keep populations under control. (292)

## Fall Planted and Overwintered Spinach

Sample 10 plants in 10 random locations unless otherwise stated.

PEST	Damaging Stage	Monitored Stages	SAMPLING		THRESHOLD	NOTES
			Method	Frequency		
<b>Garden Webworm</b> <b>Beet Webworm</b> (149, 863, 194, 915)	larval	adult larval	Check leaves & buds of small plants.	weekly	5% of plants infested with small larvae	<b>Treatment:</b> Treat before significant webbing has occurred.
<b>Beet Armyworm</b> (145, 149)	larval	Adult larval	Count # of larvae per plant.	2x/week	<b>Seedlings:</b> one larva/10 plants <b>Established Plants:</b> one larvae/2 plants	<b>Sampling:</b> Begin sampling as soon as seedlings emerge.
<b>Aphids</b> (145, 50)	all	all	Check underside of leaves	weekly	<b>Seedlings:</b> one aphid/plant <b>Established plants:</b> 4-10 aphids per plant	If population is localized, spot treat. Overuse of pyrethroids kill predators & parasites that help keep aphid populations under control. (292)
<b>Leafminers</b> (145, 915)	larval	larval	Sample as soon as plants emerge.	weekly	50% of plants have eggs or mines <b>OR</b> $\geq 1$ mine/leaf on average. <b>Near Harvest:</b> 4% of leaves with mines	Continuous use of Lannate for Lepidopterous larvae may result in leafminer outbreaks. (292)

## All Plantings

Disease	Sampling	Frequency	Threshold	Notes
<b>Downy Mildew</b> <b>Blue Mold</b> (168)	Begin scouting after emergence. Random sample 10 plants in 10 locations.	weekly	presence	Downy mildew is not a problem when temperatures exceed 90°F.
<b>White Rust</b> (168)	Random sample 10 plants in 10 locations looking for white blister-like pustules on underside of leaves. Tissue next to pustules may turn brown. (168, 915)	weekly	presence	Disease development favored by clear, relatively warm (about 72°F), dry days followed by cool nights with free moisture on leaves. (915)
<b>Leaf Spots</b> (915)	Random sample 10 plants in 10 locations.	weekly	presence	<b>Treatment:</b> apply controls when disease is first noticed. Disease favored by long periods of 90-100% relative humidity, night time leaf wetting & temperature of 77-86°F. (915)

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\***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. They are meant to be used as guidelines. As such, they should be validated on small acreages 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.