

## Rutgers Cooperative Extension

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# LEAFY CRUCIFERS IPM FIELD GUIDE

## COLLARDS, MUSTARD GREENS, KALE, TURNIP GREENS

### Pre-planting Decisions:

1. Use hot water seed treatment and resistant varieties for disease control. (292)\*
2. Practice 3 year rotation from cole crops for black rot, Alternaria leaf spot, white leaf spot, downy mildew and sugar beet cyst nematode control; 4 year rotation for blackleg control and 7 year rotation for clubroot control. (292, 26)
3. Adjust soil pH with hydrated lime to as close to 7 as possible for clubroot control. Improve drainage by making ditches and growing crop on raised beds. (292, 421)
4. Fertilize according to soil test recommendations. (1584)
5. Take soil samples in the fall prior to planting leafy cole crops to determine whether nematodes are a problem and treatment is required. (1141)
6. Destroy weeds bordering the field to avoid aphid transmitted virus diseases.
7. Identify the weeds in each field and select recommended control strategies for those weeds. Map perennial or noxious weeds. Match any preplant incorporated or preemergence herbicide rates to soil type and % organic matter in each field. (292)

### Emergence to Harvest:

Begin scouting one week after seedling emergence or transplanting. Sample 5 plants in 10 random locations.

Pest	Damaging Stage	Method	Sampling Frequency	Threshold	Notes
<b>Flea Beetles</b>  (138, 711)	adult	Pay particular attention to field margins. Because flea beetles jump quickly, make observations as the plant is approached. Avoid allowing your shadow to fall on plants being scouted.	2x/week	50% of plants infested and “shothole injury” present (526) <u>OR</u> 1 beetle/plant throughout the field <u>OR</u> 3-5 beetles/plant on 10% of stand (601) <u>OR</u> 1 flea beetle/plant up to the 6 leaf stage (711)	Spot treat if flea beetles are concentrated on plants near field margins.
<b>Aphids: Green Peach Aphid Turnip Aphid</b>  (50, 1472)	all	Scout upwind borders of fields with cruciferous weeds or crops, checking all quadrants because populations often are clumped. Random sample 5 plants in 10 locations, checking undersides of leaves. Check for predators & parasites.	weekly	No threshold established.	Overuse of pyrethroids kill predators/parasites that help keep aphid populations under control. (292) Aphids transmit turnip mosaic virus in less than one minute of feeding.
<b>Diamondback Moth (DBM), Imported Cabbageworm (ICW), Cabbage Looper (CL)</b> (31, 32,33, 601)	larval	Sample 5 plants in each of 10 random locations. If a larva of any species is found, record the plant as an infested plant. Multiply # of infested plants by 2 to get % infested plants.	weekly	<b>Spring to mid -May</b> 20% plants infested. <b>mid-May - mid-Sept.</b> 12% plants infested. <b>those after mid-Sept:</b> 20% plants infested (433)	Immediately plow down harvested cole crop fields to eliminate the buildup of DBM in crop residues.

Look for the presence of disease while scouting for Lepidopterous larvae. Investigate any suspicious plants.

Disease	What to Look For	Frequency	Threshold	Notes
<b>Anthracnose</b> (1141)	Small, rounded spots with dry, generally straw colored centers on leaves, petioles & stems (1141)	weekly	presence	Favored by leaf wetness for $\geq 16$ hours & temperatures of 60-77°F. Sporulation abundant with relative humidity > 90% for > 12 hours + temperature > 57°F.
<b>Black Rot</b> (711, 915)	V shaped, bright yellow to orange areas on the margins of leaves. (421, 1141)	weekly	presence	Enter field <u>only</u> when leaves are dry to avoid spreading the disease. (1141)
<b>Clubroot</b> (26, 711)	Look for plants which wilt late in the day, often appearing stunted, unthrifty, perhaps with a blue green color. Check for large swollen, distorted roots. (711)	weekly	presence	No control in infected plants. Rogue infected plants and remove from field. Use information for preplant decisions in the future (see above).
<b>Fusarium Yellows</b>	Symptoms appear as a unilateral wilting (one sided) with vascular discoloration.	weekly	presence	No control in infected plants. Use information for preplant decisions in the future. (see above)
<b>White Leaf Spot</b> (711)	Scattered, minute, circular, white to tan spots contained by leaf veins. (711)	weekly	presence	Favored by cool temperatures (55 to 75° F), rainfall & long periods of high humidity. (1141)
<b>Alternaria Leaf Spot</b> (711, 915)	Brown, round spots which often have concentric rings, usually on older leaves. (711, 1141)	weekly as plants near maturity.	presence	Most severe during the coolest part of the season. Favored by leaf wetness $\geq 16$ hours & temperatures of 60-77° F. Sporulation abundant with relative humidity > 90% for >12 hours + temperature > 57° F. (1141, 711)
<b>Powdery mildew</b> (915)	Extensive white powdery fungal growth, principally on upper surface of leaves (1141)	weekly	presence	Favored by prolonged dry periods with cool nights. Affects both new and old foliage. Can appear suddenly. Sulfur sprays effective for control. (1141)
<b>Downy mildew</b> (711, 915)	white, downy type of mold on <u>undersides</u> of leaves. Later, slight yellowing occurs on top side of leaves in poorly delineated spots. (1141)	weekly when conditions are favorable for disease development.	presence	Favored by temperatures 50 - 59° F, high humidity, dew formation, drizzling rain and heavy fog. (711)

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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 for additional information or assistance.