

Commercial Spinach IPM

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Insects

Aphids:

- Scout spinach plants weekly, especially the underside of the leaves. Apply insecticide if one aphid per plant on seedling plants or 4-10 aphids per plant on established plants are found.
- Natural aphid predators will help control populations and should be considered prior to treating.

Cutworms: (Black Cutworm, Variegated Cutworm, and Granulate Cutworm)

- If cutworms are noticeably reducing plant stands, an early season foliar treatment may be necessary.

Flea Beetles:

- No economic thresholds have been established; apply foliar treatment if beetles are present.
- Plowing under weed and crop debris after harvest may disturb the lifecycle of this pest.

Garden Webworms:

- Leaves and buds of small plants should be monitored for webbing, or other signs of webworm infestation. Treatment should be applied when 5% of the plants are infested with small larvae.

Grasshoppers:

- No economic thresholds are currently available, but weekly scouting may allow for early detection and hence early treatment, which may reduce the problem at harvest.

Spinach Leafminer:

- Weekly scouting for larvae and/or mines should begin once plants emerge and should continue throughout the growing season. Treatment is recommended if half of the plants being monitored have eggs or mines or if one or more mine per leaf is found.

Seed Corn Maggot (SCM):

- In fields with previous SCM infestations, use treated seed or apply a seed protectant at planting.
- To reduce the potential damage from this pest, plow weeds or cover crops at least 2 weeks prior to planting, avoid over-fertilization with manure, and plow under crop debris immediately after harvest.

Worm Pests: (Beet Armyworm and Cabbage Looper)

- Biweekly monitoring of 100 random spinach plants (10 plants from 10 separate locations) will help to assess potential worm problems. Insecticide treatment is recommended if one larva per 10 plants is found on seedlings or one larva per 2 plants on established plants. The number of worm pests can be combined to make a control decision.

Consult the Commercial Vegetable Production Guide (456-420) for insecticide recommendations.

Diseases

Anthracnose:

- Preventative fungicides can be applied beginning 2-3 weeks after emergence on a 7-10 day schedule, especially if warm, wet weather is prevailing.
- Plants should be scouted weekly to monitor for anthracnose occurrence. If infected plants are found, they should be removed and destroyed immediately.
- Good sanitation practices and crop rotation are essential to stop disease spread to additional plantings.

Blight (Cucumber Mosaic Virus):

- Cucumber mosaic virus (CMV) is transmitted by aphids, which feed on infected weeds, before moving into spinach. Therefore, proper control of both the aphids and weeds is an essential blight management practice.

- Resistant varieties may also provide additional protection against CMV.

Damping-off:

- The most common agents of this disease are *Pythium* spp. and *Rhizoctonia solani*.
- Preventative fungicide applications will help manage damping-off throughout the growing season.
- Crop rotation may help to minimize buildup of fungi within the soil.

Downy Mildew: (Blue Mold)

- A preventative fungicide application can be made as soon as plants begin growing or shortly after cutting. If this application is not made, random checks should begin after plant emergence and continue on a weekly basis. If downy mildew is found, treatment should begin immediately and should be repeated every 7-10 days as disease pressure warrants.
- If this disease has been a problem in a previous planting, rotate away from spinach for at least 2 years.

Leaf Spot:

- Follow treatment recommendations for downy mildew. In addition, sanitation practices are essential to stop disease spread if detected. Crop rotation may or may not be effective.

White Rust:

- Currently, no viable control options for white rust are available. Emergency and Special Local-Needs Labels may be obtained for white rust control. Contact the local Extension office or experiment station for application status and/or further information.

Consult the Commercial Vegetable Production Guide (456-420) for fungicide recommendations.

Weeds

- Scout each field and keep records of the weed species present, their location and population density.
- Design a control program based on weed records for the specific problems in each field.
- Chickweed and henbit are two of the most troublesome weeds for spinach producers in Virginia.
- Herbicides are the most valuable tools in a weed management program, but should be used in conjunction with cultural and mechanical methods of weed control whenever possible.
- Select the herbicide that best fits your specific weed infestation. Preplant-incorporated and postemergence treatments are labeled. Emergency and Special Local-Needs Labels may be applied for to provide additional, more effective herbicide options than are currently available. Contact the local Extension office or experiment station for further information.

Consult the Commercial Vegetable Production Guide (456-420) for herbicide recommendations.

References

Alexander, S.A., Caldwell, J.S., Hohlt, H.E., Nault, B.A., O'Dell, C.R., Sterrett, S.B., and Wilson, H.P. 2000. Virginia Commercial Vegetable Production Recommendations (456-420). Virginia Cooperative Extension, (pg. 129-131).

For further information, contact your local Extension agent.