

Rutgers Cooperative Extension

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WINTER SQUASH AND PUMPKIN IPM FIELD GUIDE

Pre-planting Decisions

1. Select varieties for disease resistance and rotate cucurbits with crops other than pepper, tomato and eggplant for at least 3 years. (151, 1330)*
2. Select a field with excellent drainage, subsoil or “V-rip” prior to planting and construct drainage ditches to allow excessive water to leave field during heavy rains. (1330)
3. Create a gradual sloping ridge for each row of pumpkins and do not leave a depression around the base of pumpkins after seeding or cultivating. (1330)
4. Apply lime and fertilizer according to soil test recommendations. (1584)
5. Use a combination of cultural practices to reduce problems from seed corn maggot:
 - plow down cover crops 3 - 4 weeks before planting.
 - completely bury cover crops or previous crop residues to reduce adult fly attraction to rotting organic matter.
 - allow manure to age before incorporating and avoid use of heavy applications close to planting.
 - attach a set of drag chains behind the planter to reduce the moisture gradient.
 - use seed treatment. (292)
6. Identify the weeds in each field and select recommended control options for those weeds. Map perennial or noxious weeds. Match preplant incorporated and preemergence herbicides to soil type and percent organic matter in each field. (292)

Plant Emergence to Four Leaf Stage

(Fields should be scouted in a “Z” pattern throughout the field with special attention given to borders when indicated. Begin scouting at plant emergence.) (358)

PEST	Damaging Stage	Monitored Stage	SAMPLING		THRESHOLD	NOTES
			Method	Frequency		
Seed Corn Maggot (802)	larval	larval	Scout field looking for areas of weak, sickly or missing plants as crop is emerging, especially under cold, wet conditions.	1-2x as crop emerges	none established	There are no rescue treatments, however if damage is severe enough to replant, consider soil applied insecticide. (292)
Squash Bugs (381)	adult nymph	adult nymph eggs	At early flowering, check the underside of the lower leaves of five plants in ten locations for egg masses. Young nymphs feed in close groups on the underside of leaves. Check plants and soil surface around plants for adults. (381)	weekly	> 1 egg mass per plant	Key to management is early detection and control of nymphs. Small yellow specks later turning brown are evidence of feeding on leaves. If feeding is severe, leaf turns brown and dies.
Striped & Spotted Cucumber Beetles (51, 52, 179)	adult larval	adult	Sample 10 plants in 5 random locations. Check field edges next to overwintering sites (near buildings, along fence rows, in woodlots). During hot windy days, look for beetles hiding in cracks in the soil surface or under plastic mulch.	2x per week	Seedlings: ≥ 2 beetles on three out of five of the sites. (915)	Cucumber beetles vector bacterial wilt and squash mosaic virus. Hubbard and butternut squash are susceptible to bacterial wilt, but Jack-o-lantern pumpkins are rarely susceptible.

Four Leaf Stage to Harvest

PEST	Damaging Stage	Monitored Stage	SAMPLING		THRESHOLD	NOTES
			Method	Frequency		
Aphids	all	all	Examine 10 older leaves at five representative sites per field. (284)	weekly	20% of leaves have ≥ 5 live aphids/leaf (284)	If population is localized, spot treat. Overuse of pyrethroids kills predators/parasites that help keep populations under control. Treatment may not be required if aphids are infected with fungal pathogens or parasitized (mummies). (284, 292)
Twospotted Spider Mite (179)	adult immature	adult immature	Begin in July. Check field borders, especially rows next to grassy areas or dirt or paved roads. Use a hand lens or shake crown leaves over white paper. Look for early signs of white stippling and pale yellow specks on the first 2 or 3 leaves at the base of the runners. Examine the crown leaves of 20 - 30 plants in the infested area. Record # of runners showing injury, presence of live mites, % of field infested.	weekly	Early Season: 10-15% crown leaves infested. Later: 50% of terminal leaves infested (292)	Infestations generally begin around field margins & grassy areas. Do not mow these areas after mid-summer as this forces mites into the crop. Mites can be spread through the field on clothing; check suspected areas last. Beneficials help keep populations under control. Overhead irrigation helps retard outbreaks. Continuous use of certain insecticides may result in mite outbreaks. Spot treat localized infestations. (292,381)
Squash Vine Borer (179, 358)	larval	adult	By late May, place pheromone traps uniformly throughout the field just above the growing foliage. Count # of moths caught. Record first significant catch of emerging moths. Scout 5 plants in 10 locations for borer frass, which looks like sawdust, near or at holes in vines. Split vines to check for larvae.	weekly	presence of moths <u>OR</u> fields with past history of borers: 4 borers/6 areas scouted. (358)	Fields with a history of borers are most susceptible to attack. Apply treatments every 7 to 10 days until moth activity drops off. Squash vine borers tend to cause the most damage in winter squash, esp. Hubbard.
Squash Bugs (179, 358)	adult nymph	adult nymph egg masses	At early flowering, check the underside of the lower leaves of five plants in ten locations for egg masses. Young nymphs feed in close groups on the underside of leaves. Check plants and soil surface around plants for adults and nymphs.	weekly	≥ 1 egg mass per plant	Do not scout nymphs or adults as a primary means of making control decisions; use as a means of assessing control.
Thrips	adult nymph	adult nymph	Examine leaves on a random sample of runners. Note presence or absence of feeding injury which appears as silver flecks on leaves, especially near large veins.	weekly	Increasing feeding injury & plants not actively growing.	

Four Leaf Stage to Harvest, continued

Pest	Damaging Stage	Monitored Stage	Sampling		Threshold	Notes
			Method	Frequency		
Leafhopper (10, 238)	adult nymph	adult nymph	If pumpkin fields are close to alfalfa, sample when leafhoppers are reported on alfalfa. Use a standard 15 inch sweep net to monitor adults. Check leaves for immatures. (915)	weekly	severe leaf injury sufficient to retard fruit maturity & affect yield (915)	Leafhopper feeding causes yellowing of leaf margins or “hopperburn”. If injury is expected to retard fruit maturity and affect yield, control is necessary. (526, 915)

Sampling procedure for diseases: scout 5 plants in 10 random locations except where otherwise noted.

Disease	Sampling	Frequency	Threshold	Notes
Angular Leaf Spot Bacterial Leaf Spot (49, 151)	Small, water soaked lesions on leaves.	weekly	presence of disease	Early detection is important. Avoid entering fields when foliage is wet. Work infected fields last and clean equipment before entering other cucurbit fields.
Gummy Stem Blight (Black rot on fruit) (47, 151)	Circular tan to dark brown spots with black specks in center (pynidia) on leaf margins. On pumpkin, a nondescript marginal necrosis followed by a larger wedge shaped necrotic area is often found. (47)	weekly	presence of disease	As plants begin to run together, examine 10 older leaves (upper & lower surfaces) at each location.
Viruses (44)	Early infections (before fruit formation) are most serious and should be noted when observed while scouting for other pests.	weekly		Up to July 1 , practice strict aphid control. After July 1 , plant late season squash & pumpkins as far away from existing cucurbit plantings as possible to prevent aphid transmission of viruses from existing fields to new fields. Use reflective mulches for bush types varieties (292)
Phytophthora Blight (93, 151)	While scouting for other pests and diseases, look for wilting of plants, especially in low lying areas where drainage may be poor.	weekly	presence of disease	Rogue Phytophthora infested plants or disc into soil completely as soon as possible. Remove pumpkins from the field as soon as they mature to prevent infection during late season rains. (1330)
Scab (gummosis) (45, 151)	Initially, pale green, water-soaked areas on leaves & runners. Gradually these turn gray to white and may become “shot-holed” in appearance. On pumpkin, lesions may appear as sunken craters; can lead to misshapen areas on fruit – often confused with those caused by anthracnose. (151)	weekly	presence of disease	Favorable weather conditions: wet weather (valley fogs, heavy dews, light rains) and temperatures <70°F with night temperatures <60° F. Use resistant varieties when possible. Controls usually begin as true leaves form. (292)
Powdery Mildew (PM)	Examine upper & under surfaces of 5 older leaves at 10 separate sites from mid-July to harvest looking for talcum-like growth on foliage & young stems. White mildew colony will be present on underside of	weekly	one lesion on the underside of 45 old leaves.	Leaves are most susceptible 16-23 days after unfolding. Favorable conditions for disease development include dense plant growth, low light intensity and high relative humidity. Mean temperatures of 68-80°F. favorable. Occurs from mid-July on. One strategy for determining when PM controls are needed is to monitor the harvest stage of summer squash

Disease	Sampling	Frequency	Threshold	Notes
(151, 1585)	lesion. (1585)		(292)	fields. Once disease is found in summer squash, scout pumpkin fields. Big Moon and Jack-Be-Little varieties appear to be resistant. (292, 1585)

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Disease	Sampling – What to look for	Frequency	Threshold	Notes
Downy Mildew (49, 151)	Scout 5 plants in 10 random locations beginning in mid-July looking for small, slightly chlorotic to bright yellow areas on the upper leaf surface of older crown leaves with a purplish growth on underside of lesion.	weekly		Disease favored by high humidity. A problem from late July on. Infected leaves hang from upright petioles - looks like the field has been hit by frost giving a “wet dishrag” appearance. NJ: Check weekly Plant & Pest Advisory for occurrence of disease in the region.

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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. 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.