Rutgers Cooperative Extension
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Prepared with support from Northeast Region SARE Program Project ENE95-7

SUMMER SQUASH AND ZUCCHINI SQUASH 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.
3. Apply lime and fertilizer according to soil test recommendations. **(1584)**
4. Identify weeds in each field and select recommended control options for those weeds. Map perennial or noxious weeds during the growing season. Match preplant incorporated and preemergence herbicides to soil type and percent organic matter in each field. **(292)**
5. Use a combination of cultural practices to reduce problems from seed corn maggot including:

- 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.

6. After July 1, select fields as far away as possible from current cucurbit crops and use reflective (aluminum) mulch to delay and/or avoid transmission of viral diseases.

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 or transplanting.) **(358)**

PEST	Damaging Stage	Monitored Stage	SAMPLING Method	SAMPLING Frequency	THRESHOLD	NOTES
Aphids	all	all	Sample 10 plants in 5 random locations, checking on the underside of leaves for aphids. Record # of aphids, predators or parasites observed and presence of mummies (parasitized aphids). Yellow trap pans containing water may be used to determine mass flights of winged aphids. **(292)**	weekly	No thresholds established but the indication of mass flights of winged aphids can be used to determine when the use of contact aphicides is most beneficial.	Overuse of pyrethroids may flare aphid populations. High aphid populations tend to be associated with periods of cool weather followed by periods of hot weather as the aphid population explodes before the predator/parasite population can compensate. Thorough coverage on both sides of the leaves is essential. Aphids vector several viral diseases.
Striped & Spotted Cucumber Beetles **(51, 52, 179)**	adult larval	adult	Sample 10 plants in 5 random locations checking field edges next to over-wintering sites (fence rows, next to buildings or wood-lots). Record estimated stand reduction, avg. # of beetles/plant & % of plants showing light, moderate or heavy feeding, respectively, & where observed in the field. Be sure to check even if fields were treated with a systemic insecticide at planting.	2 – 3x per week early when plants are small; weekly thereafter.	>5 beetles per plant Since 50-80% of plants are removed during thinning operations, control is seldom economic unless heavy populations exist.	Heavy infestations of adult cucumber beetles can destroy stems, cotyledons & emerging leaves of young plants. Cucumber beetles vector some viral diseases such as cucumber mosaic and squash mosaic virus as well as bacterial wilt, however summer squash is not as affected by bacterial wilt as melons and cucumbers. **(52)**

Disease	Sampling	Frequency	Threshold	Notes
Phytophthora Blight	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.
Scab **(45, 151)**	Scout 5 plants in 10 random locations looking for water soaked spots on leaves, extending across veins. lesions appear on petioles and stems, turning from green to gray or white, steadily becoming more irregular in shape.	weekly	presence of disease	Disease occurs during cool periods when night temperatures are < 60^{o} F. Use resistant varieties when possible. Controls usually begin as true leaves form.
Viruses **(44, 151)**	Early infection (before fruit formation) is most serious and should be noted when observed while scouting for other pests.	weekly	presence of disease	Up to July 1, practice strict aphid control. Detection of winged flights of aphids with yellow trap pans filled with water aid in determining the most beneficial times to apply contact aphicides. After July 1, plant new fields as far from existing cucurbit or other host crop fields as possible. Use reflective mulches to prevent aphid transmission. **(292)**
Bacterial Wilt **(41, 52,151)**	Look for wilting plants. Affected runners appear dark green at first and then become necrotic as the wilt becomes irreversible. Cut wilted runner close to crown of plant, rejoining cut ends, look for oozing bacterial strands as ends are pulled apart.	weekly		Plants may wilt dramatically during the heat of the day, then recover by morning.
Powdery Mildew **(151, 1585)**	Examine upper and lower leaf surfaces of 5 older leaves at ten separate sites from mid-July on looking for talcum-like growth on foliage and young stems. **(1585)**	weekly	one lesion on the underside of 45 old leaves. **(292)**	Leaves are most susceptible 16 - 23 days after unfolding. Favorable conditions for disease development include dense plant growth, low light intensity & high relative humidity, mean temperatures of 60-80^{o}F. Occurs from mid-July on.
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	presence of disease	Disease favored by high humidity. Infected leaves hang from upright petioles giving the appearance of a field hit by frost or a “wet dishrag” appearance.

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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.**