

MAJOR INSECT PESTS OF CUCURBITS

Striped cucumber beetles are about 7mm long, yellow with three black stripes that reach the end of the forewings, a yellow thorax and black head. Adults overwinter in field edges near last year's crop, with a small proportion remaining in the field.



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Bacterial Wilt

With the onset of warm days, beetles move rapidly into young crops. Adults cause direct feeding damage to cotyledons, leaves and the base of the stem. Eggs are laid in soil and larvae feed on roots. After the pupal stage is completed in the soil, summer adults emerge. These adult beetles congregate in flowers and may cause damage to fruit. Beetle feeding spreads bacterial wilt to young plants, especially before the 5-leaf stage. Cucumber and muskmelon are highly susceptible to wilt; watermelon is not. To prevent bacterial wilt in susceptible crops, scout for beetles twice weekly at the seedling stage. Treat when beetle numbers reach 1 beetle per 2 plants. SCB vector the disease Bacterial Wilt.

Squash bug adults are ½" to ¾" long, flattened and grayish-brown. The edge of the abdomen is marked with alternate gold and brown patches. Adults are long-lived and lay eggs over several weeks. A single female can lay



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up to 250 eggs. Yellow to bronze colored eggs are laid in an orderly cluster on the underside of leaves, often in the junction of leaf veins, and hatch in 7-10 days in summer conditions. Newly hatched nymphs are light green when small, with a brown head and dark legs, and are usually found in groups. Nymphs become light gray, then darker gray to brown and more solitary as they grow and molt through five nymphal stages. Adults overwinter in protected areas such as field borders or woods edges, and may also survive in crop residues in the field. Adults move into vine crops in June and early July to mate and lay eggs. There is one generation per year in the Northeast, and the complete life cycle requires 6-8 weeks. Both adults and nymphs feed by inserting their stylets (sharp, sucking mouthparts) and sucking sap from plant tissue, interrupting xylem transport and causing wilting in leaves, stems, and vines. Squash bugs may also feed on fruit, causing scarring, and are the vector of the bacterium that causes Cucurbit Yellow Vine Decline. The population level that will be damaging to the crop will vary with the crop and its stage of growth. Controls are warranted if you see more than one egg mass per plant, especially early in the season.

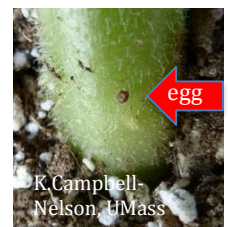
Squash vine borer moths are day-flying 'clear wing' moths with a 1 to 1 ½" wingspan, black forewings, clear hind wings, and a bright orange abdomen. In flight, they look like wasps. There is one generation each year and adults emerge in late June/early July. Eggs are oval, reddish-



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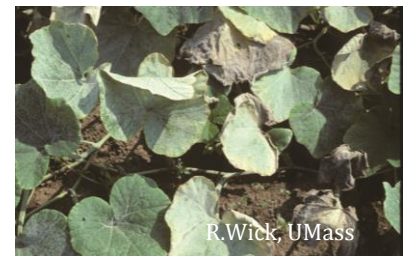
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brown in color, and glued to the stem or petiole. The large cream-colored larvae are 1" to 1 ½" long and 3/8" wide. The pupae survive the winter 1- 2" deep in the soil. Preferred hosts have thick stems, while thin-stemmed squashes tend to be more resistant to attack. Typically growers first notice this pest in July and August, when vines wilt during the heat of the day, and upon closer inspection find frass and feeding holes. By the time wilting is observed, it is likely too late to do anything, so scouting fields and using pheromone traps to monitor adult flight is imperative where this pest is established. Winter squash, pumpkins, and zucchini are most susceptible while butternut squash is resistant.

MAJOR DISEASES OF CUCURBITS

Powdery mildew (PM) (*Podosphaera xanthii*, *Erysiphe cichoracearum*) symptoms occur on leaf surfaces, stems, and petioles as white, powdery fungal growth. Symptoms develop first on older leaves, shaded lower leaves, and leaf undersides. Infected leaves shrivel and die; plants may senesce prematurely. The pathogens are obligate parasites and cannot survive in the absence of living hosts;



initial inoculum for the Northeast is most likely airborne conidia originating in southern states. Other possible sources include greenhouse grown cucumbers and alternate hosts. Under favorable conditions, PM develops rapidly; the time between infection and symptom expression can be as short as 3 days and many spores are produced. Conditions favoring infection include a dense plant canopy, low intensity light, high nitrogen fertilization, and high relative humidity (infection can occur at relative humidity < 50%). Optimum temperatures for disease development are 68-80° F, but infection can occur between 50-90° F. Temperatures of 100° F or above stop PM development. Scout fields regularly (esp. lower leaf surfaces) and apply fungicides early in disease development. Thresholds are very low as PM spreads rapidly and cannot be controlled once disease is established.

Downy mildew (CDM)

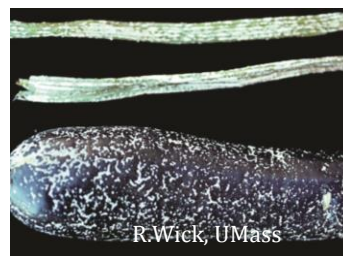
(*Pseudoperonospora cubensis*) symptoms are confined to the leaves and their appearance varies widely among cucurbit species. On most species, lesions are first visible on the upper leaf surface as small, irregular to angular, slightly chlorotic (yellow) areas.



irregular to angular, slightly chlorotic (yellow) areas. Symptoms appear first on older leaves and progress to younger leaves as they expand. When leaf wetness and humidity favor sporulation, the production of fruiting bodies (sporangia) on the lower leaf surface gives the undersides of the lesions a downy appearance, varying in color from light gray to deep purple. Lesions can coalesce and result in large areas of dead tissue, which exposes the fruit to sunscald. *P. cubensis* infects only members of the cucurbit family and is an obligate parasite. The source of primary inoculum in cold climates is generally windblown sporangia from areas where plants survive the winter. The progress of CDM is tracked by the Cucurbit Downy Mildew Alert System (<http://cdm.ipmpipe.org/>). At least five pathotypes of CDM have been described. Cucumber and melon are susceptible to all, while squash and melon cultivars vary in their reactions. Spread of CDM within a field can be by air currents, rain splash, workers, and tools. The main means of control are fungicide applications, the use of resistant cultivars, and cultural practices. Maximum control can be achieved only with a combination of these measures.

Plectosporium blight

(*Plectosporium tabacinum*) lesions are small (<1/4") and white. On vines, petioles and leaf veins, the lesions tend to be diamond to lens-shaped; on fruit and leaves lesions are usually round.



The lesions increase in number and coalesce until most of the vines and leaf petioles turn white and the foliage dies. On fruit, *P. tabacinum* causes white, tan, or silver russeting, which can merge to form a continuous dry, scabby surface. *P. tabacinum* is a common fungus in the soil and on decaying plant material and is favored by warm, wet weather. The fungus can overwinter on crop residue and can persist in the soil for several years. The spores are spread by rain-splash and wind. Many strains of the fungus are weakly parasitic. *Plectosporium* has not been reported to be seed-borne. Tiny, one or two-celled, sickle-shaped spores are formed in lesions on vines, stems, fruit, leaves and leaf petioles. Scout fields and apply protectant fungicides when the disease first occurs.