

MAJOR INSECT PESTS OF BEANS



Potato Leafhoppers (PLH) are about ¼" long, light yellow-green, and can be difficult to detect until their numbers reach high levels, as they fly up when foliage is disturbed or shaken. Nymphs are light green, wedge-shaped and very fast moving. Nymphs can be found on the undersides of leaves, and tend to move sideways, crab-like, on the leaf surface. Adults and nymphs feed by inserting a needle-like beak into the plant and sucking out sap. They also inject a toxin into the plant, which causes yellowing, browning, and curling of leaves. In beans the leaf turns mottled brown and curled, as if infected with a disease, before dying completely – a condition known as hopperburn. PLH overwinter in the Gulf Coast states and move north in spring, arriving in New England around mid-June. Monitor by first gently shaking plants and estimating the number of adults flying up. Inspect undersides of leaves and count nymphs. In green beans, thresholds are 2/ft of row at the seedling stage, and 5/ft of row from 3rd trifoliate leaf to bud stage.



Mexican Bean Beetle (MBB) adults are coppery brown with black spots. They are related to lady beetles but feed on foliage instead of other insects. Shortly after adults arrive in a bean field, they lay yellow-orange egg masses on the underside of bean leaves. These hatch into bright yellow, spiny, oval larvae, which feed, molt several times as they grow, and pupate on the underside of leaves. Feeding damage from adults and larvae can reduce yield and injure pods if numbers are high. Adults overwinter near bean foliage and colonize bean plants in June. There are 2-3 generations per season. The complete life cycle takes 30-40 days in the summer months, but closer to 60 days when temperatures are cooler. *Pediobius foveolatus* is a commercially available non-stinging parasitic wasp that lays its eggs in Mexican bean beetle larvae. Wasp larvae feed inside the MBB larva, kill it, and pupate inside it, forming a brownish case or 'mummy'. About twenty five adult wasps emerge from one mummy. Adult wasps will emerge from mummies within 14 to 18 days after stinging. We recommends two releases, two weeks in a row, coinciding with the beginning of Mexican bean beetle egg hatch. *Pediobius* is available from the following sources: New Jersey Department of Agriculture, Tom Dorsey, 609-530-4192 or www.arbico-organics.com.

MAJOR DISEASES OF BEANS

Bean Rust is caused by (*Uromyces appendiculatus*), and infects most beans only under prolonged periods of warm, moist weather. Symptoms develop on leaves and pods as pustules of red-brown powdery spores (urediniospores) which rupture the epidermis. They are often surrounded by a yellow halo. Rust fungi have extremely complex life cycles, often involving two hosts and up to five different spore stages. Rotate bean with non-host crops. Plow under infected crop residues. Disinfect poles in production of pole beans.



Bean Bacterial Blight is caused by *Pseudomonas syringae* pv. *phaseolicola*. Leaf symptoms first appear as small, water-soaked spots on the lower leaf surface. These lesions rapidly become necrotic and are visible on both upper and lower leaf surfaces. Infection of expanding leaves may result in leaf distortion. A chlorotic zone of yellow tissue (halo) develops around necrotic spots. In cases of severe infection, a generalized systemic chlorosis can occur. Symptoms also occur on pods and stems as water-soaked, red or brown lesions which may exhibit crusty bacterial ooze. Sources include contaminated seed and infected crop residue. The bacteria enter the plant through natural openings or wounds during periods of high relative humidity or free moisture. At cool temperatures, the pathogen produces a toxin, phaseolotoxin, which is responsible for systemic chlorosis. After 7-10 days, bacteria ooze from lesions imparting a greasy appearance. Seed produced in arid areas and tested for freedom from Halo blight should be used. Furrow or drip irrigation is preferred to prevent secondary spread of the bacteria. Rotate to non-host crops for 2-4 years.



Bean Anthracnose (*Colletotrichum lindemuthianum*) infects all aerial parts of the plant. Lesions are more common on leaf petioles, the lower surface of leaves, and leaf veins where they are elongate, angular, and brick-red to purple becoming black. Pod infections occur as tan to rust colored lesions that become sunken cankers with a raised black ring and brownish red border. Bean anthracnose survives between crops in infected crop residue and can be disseminated in seeds, air, and water. Lesions begin producing fruiting bodies (acervuli) and conidia within 2-4 days of infection. Production of conidia and new plant infections are favored by temperatures of 55-79°F and relative humidity greater than 92 %. Frequent, moderate rainfall, particularly if accompanied by winds or splashing rain favor disease development. Surface seed sterilization can be effective.



White Mold (*Sclerotinia sclerotiorum*) also causes disease on more than 360 different plant species. Infections consist of prominent white, cottony mycelium covering affected plant parts. Survival structures, known as sclerotia, which are about the size of mustard seeds, black in color, and resemble mouse droppings, develop on diseased tissue and within killed stems. Initial lesions are small, circular, water-soaked and light green but rapidly increase in size. Affected tissues dry, turn brown, and may be covered with a white, cottony mycelium. Sclerotia form in infected tissue and entire branches or plants may be killed. White mold of beans develops after or during the flowering period, as the fungus needs the senescing tissue for nutrition to begin the infection process. The fungus is favored by cool, moist weather, high humidity, and long periods of leaf wetness. All aerial parts of the plants including pods and seeds may be attacked. *Sclerotinia sclerotiorum* overwinters in the soil as sclerotia and can persist there for 5-8 years. Rotate with non-hosts for up to 8 years. Non-hosts include grasses, cereals, and onions.

