



Greenhouse TPM/IPM Bi-Weekly Report
University of Maryland Cooperative Extension
Central Maryland Research and Education Center

From: Stanton Gill, Extension Specialist – IPM for Greenhouse and Nurseries, CMREC, University of Maryland Cooperative Extension
Karen Rane, Extension Specialist, Director of the Plant Diagnostic Clinic, University of Maryland Cooperative Extension
Suzanne Klick, Technician, CMREC, University of Maryland Cooperative Extension

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Asters and Chrysanthemum

Aster and chrysanthemums have been placed out by many growers into the field. With all of the rain from June 15 – 20 there is a lot of leaching of nutrients occurring. Many people are applying 400 ppm based on N applications of fertilizer trying to keep the fertility levels up. If you do this make sure you monitor the EC regularly and don't get the level above 1.0 – 1.5 millimohs or you are likely to cause root injury. John Speaker reports that he is finding thrips very active on asters. Leafminer is also active on asters.

Leafminers

The larvae tunnel through the leaves, feeding on the parenchymal between the upper and lower epidermal leaf surfaces. The species that usually attack aster is in the genus, *Liriomyza*, and produces a serpentine mine. These mines appear in the upper leaf surface three to five days after oviposition. In addition to the mines, leaves may appear stippled due to the numerous feeding punctures made by the female fly's ovipositor.

Control: Avid, Marathon (imidacloprid), or TriStar.



Aster Diseases

Botrytis Blight can first be seen as discolored, watersoaked areas on petals or leaves, which will enlarge and develop the characteristic gray or brown fuzzy fungal growth that gives the disease its other common name, gray mold. The causal fungus, *Botrytis cinerea*, has a wide host range, and can be spread as spores, mycelium, or black, rounded sclerotia. No aboveground part of the plant is immune to this aggressive pathogen - flower bud collapse, leaf blight and stem lesions are all symptoms of the disease. Since *B. cinerea* remains viable in soil year-round, careful attention to soil quality and sanitation is a necessary part of effective control. Diseased flower petals and other debris can also be a source of inoculum. Remove and destroy infected plants. Further control measures include avoiding moisture on the foliage. Keep water on the soil surface and water during morning hours, if possible. Adhere to strict sanitation practices;

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maintain good air circulation and spacing between plants. Avoid excessive fertilization. In greenhouses, keep humidity below 93%. Fungicides effective in managing this disease include those containing chlorothalonil, mancozeb, or iprodione.

Leaf Spots on asters can be caused by a number of fungi, including *Alternaria*, *Aschochyta*, *Cercospora* and *Septoria*. Symptoms include small to large brown spots and blotches. Entire leaves may turn yellow and die. Symptoms usually progress from the lower leaves upward, as splashing water moves spores from leaf to leaf in the plant canopy. As with Botrytis, practices that reduce leaf wetness, such as avoiding overhead irrigation, watering early in the day, and increasing plant spacing will help to reduce fungal leaf spot diseases. Protectant fungicides include azoxystrobin, mancozeb, triforine, triadimephon, and thiophanate-methyl + mancozeb.

Fusarium Wilt can be a problem for many different plants. Caused by the fungus *Fusarium oxysporum*, it is typically noticed as yellowing and wilting, frequently on one side of the plant, and is accompanied by brown discoloration of the vascular system. . The spores will survive in soil for many years, so unless using sterilized soil or a soil-free medium, don't plant susceptible crops in the same soil year after year. Management can be improved by liming the soil and using nitrate nitrogen fertilizer.

Aster Yellows is caused by a phytoplasma (a microorganism similar to a bacterium, but without a cell wall), and is spread through the feeding activities of leafhoppers. The disease can attack a large number of plant species, including many ornamentals and weeds. Symptoms include chlorosis, shortened internodes, plant stunting and abnormal branching. Flowers become distorted, with petals replaced by green, leaf-like structures. There is no chemical control for the disease. Symptomatic plants should be removed, including any weeds in the vicinity that show similar symptoms.

Leafhopper management: Imidacloprid or dinotefuron can be applied to control leafhoppers, but it only takes one feeding for the leafhoppers to transmit the disease.

Photo of aster yellows on *Echinacea purpurea* by Whitney Cranshaw, Colorado State University, Bugwood.org



Growing Large Potted Tomatoes

Many rowers are growing large potted tomatoes for sales in summer. John Speaker picked up potato beetle feeding on potted tomato this week. If you moved your tomato plants outdoors then the potato beetle may find you. The larvae are plump and squat looking

Control: Carbaryl (Sevin)

Photo of Colorado potato beetle by Eugene E. Nelson, Bugwood.org



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Tomato Late Blight

Samples of tomatoes being diagnosed with late blight are just starting to appear in Maryland, and have also been reported in Pennsylvania. The cool, wet spring this year was highly favorable to the development of this devastating disease. *Phytophthora infestans* is the fungus-like pathogen that causes late blight on potatoes as well as tomatoes. Unfortunately, few cultivars of commercial tomatoes are resistant, so epidemics can occur rapidly. Tomatoes can be completely defoliated in a short time - stringent management is essential.

Infection may begin with the introduction of infected transplants or with spores blown in from elsewhere. In young plants, lesions will appear first on older leaves as water-soaked gray patches that extend rapidly; lesions will also affect the stem. A whitish fuzz indicating production of sporangia may be noticeable, especially in damp conditions. The pathogen can infect stems and fruit as well.



Photo by Howard F. Schwartz, Colorado State University, Bugwood.org

Regularly inspect production areas for signs of infection. Start control with good sanitation practices and a low rate of protectant fungicide. Keep foliage as dry as possible, and avoid overhead watering. There are a number of fungicides labeled for use on tomatoes in the field, including chlorothalonil, mancozeb, strobilurins and copper compounds. Of these products, only mancozeb (Dithane F-45) is labeled for use on tomatoes in the greenhouse.

Cosmopepla lintneriana Activity

Cosmopepla lintneriana (twice stabbed stink bug) has been active on plants here at the research center throughout June. It is commonly found feeding on snapdragons, but has a wide plant host range. Damage includes aborted flower buds and distorted growth.

Control: Talstar (bifenthrin), Orthene (acephate)



Flowering Kale

We had a request for information on starting flowering kale for fall greenhouse production. The flowering kales were very popular back in the 1990s but have somewhat died-down in popularity since then. Keep in mind this is an 11 week crop so for late fall don't start your plants until mid-July. The color really comes on when it starts getting cold at night. The seed for most commercial cultivars was developed by Sakata Seed America or Takii America. The seed is available through many different wholesale seed companies.

The shape of the leaf determines whether it is called flowering cabbage and or flowering kale. Cultivars with smooth leaf margins constitute the flowering cabbage group while those with divided or "fringed" leaf margins are considered flowering kale. Within the kale group there are two types: the most common are the "fringed leaved cultivars" which have finely ruffled leaf margins and a smaller number which are called "feather leaved cultivars" have leaves that are finely serrated and deeply notched. A grower should select depending on growth habit and coloration that your customers want. In each series there is normally a white, pink, and red cultivar.

Flowering cabbage cultivars: Tokyo series, Osaka series, Pigeon (red, pink and white) and Color-up series

Fringe-leaved cultivars – Sparrow series, Chidori series and Kamone series (reds and whites), and Naygoya series

Feather-leaved cultivars – ‘Coral Queen’, ‘Coral Prince’, ‘Red Peacock’, and ‘White Peacock’

Culture: The tough part is that growing ornamental cabbage and kale in summer in Maryland can be challenging if the temperatures are high. Cabbage and kale grow best in cool weather (55° to 60° F) nights. Since outdoor temperatures frequently exceed this range during the summer, select a site which has good air circulation and is "relatively" cool.

With high temperatures in the summer there will be excessive stem elongation due to high temperatures. To prevent stem elongation make a 1500 to 3000 ppm B-Nine application when the plants have developed true leaves and before stem elongation occurs. Several applications (it might be as often as once a week) at the same rate may be made during July and August as needed. Do not apply B-Nine if the crop is going to be marketed as an edible crop.

Plant Nutrition: Maintain the substrate pH levels between 5.8 and 6.5. Many growers have used controlled release fertilizers with cabbage and kale with good success. Begin fertilizing at the rate of 50 to 100 ppm N and K after seedlings emerge. Once transplanted, fertilize at the rate of 150 to 250 ppm N and K with periodic applications of a complete fertilizer such as 20-10-20.

Make sure you keep the fertility and mist levels correct or the plants suffer. Lack of nitrogen will result in the plants turning yellow and losing lower leaves. Maintain fertilization until night temperatures drop and coloration begins which is October in Maryland. In October reduce fertilization to 50 ppm N and K. Excess nitrogen during this period will prevent good coloration.

Upcoming Programs

Cut Flower Farm Tour, July 27, 2009

Location: Farmhouse Flowers and Plants (Brookeville) and Plantmasters (Laytonsville)

Contact: Suzanne Klick, 301-596-9413