Significance to the Horticulture Industry

Brown Marmorated Stink Bug

Evaluating Impacts of Brown Marmorated Stink Bug on Non-fruiting Nursery Crops. Victoria P. Skillman and Jana C. Lee. *Journal of Environmental Horticulture* 35(3):93–98.

The brown marmorated stink bug (BMSB) is an economic pest of many agricultural crops, causing up to 90% loss in stone fruits (Leskey et al. 2012). In nurseries, the BMSB is more often found on woody ornamental plants with mature fruit than without (Martinson et al. 2015) and their feeding causes disfigurement and brown spots in fruit (Leskey et al. 2012). However, nurseries may sell plants before the fruiting stage or prune fruits off larger plants to promote foliage production; it is not known how BMSB might affect the vegetative growth of fruitless plants. This study explored whether vegetative growth was impacted by the presence of BMSB among several common ornamental crops. Little or no changes were observed in growth of all plant species at one to two months, the period when differences might be most apparent before the plant outgrows feeding damage. Growers can use this information to help decide on management when they find BMSB on their non-fruiting nursery crops.

Herbicide Leaching

Dimethenamid Persistence and Leaching Potential in a Soilless Mix. Lori Robertson and Jeffrey F. Derr. *Journal of Environmental Horticulture* 35(3):99–102.

Weed control is an important management concern in container nursery production. An important way weeds are controlled is through the use of preemergence herbicides. Dimethenamid was more effective for southern crabgrass and spotted spurge control than pendimethalin. The effectiveness of preemergence herbicides is dependent on the amount of leaching that occurs. A sprayable formulation of dimethenamid exhibited less leaching than a granular form of pendimethalin in a pine bark substrate. The low level of leaching for dimethenamid explains the effectiveness of this herbicide for weed control in containers.

Liquid Mulch

Efficacy of Bio-based Liquid Mulch on Weed Suppression and water Conservation in Container Nursery Production. Kate Shen and Youbin Zheng. *Journal of Environmental Horticulture* 35(3):103–110.

Weeds control in a major issue either in horticultural crop production or in landscape maintenance. This research demonstrated that a newly-developed bio-based liquid mulch could be used to control weeds and conserve water if the shrinking issue could be resolved. The liquid mulch dried and shrunk within a couple of days of application. This caused a gap of approximately 10 to 15 mm (0.39-0.59 inch) between the wall of the pots and the actual dried mulch.

Phosphorus Longevity

Effect of pre-plant phosphate charge and leaching on phosphorus longevity in soilless substrate. Amy J. Compton Horner, Carl E. Niedziela Jr., Paul V. Nelson, and David A. Dickey. *Journal of Environmental Horticulture* 35(3):111–116.

It is now common practice to grow ornamental container crops with a marginally low phosphorus stress to achieve compactness, aesthetic quality, and in the case of plants valued for their red or purple color, deeper pigmentation. However, excessive stress must be avoided to prevent irreversible symptoms of chlorosis and necrosis. The choice of pre-plant phosphate fertilizer in the root substrate impacts growth and flowering of longer term crops such as chrysanthemum and geranium. When these plants transition from foliar to flower growth, root uptake of phosphate declines while an increased demand occurs in the flowers. To maintain a marginally low P stress at this stage, there must be an ample supply of P in the foliage, otherwise unacceptable P deficiency symptoms will occur in the foliage due to translocation of P to flowers. Knowledge of the longevity of pre-plant phosphate must be known to design the post-plant fertilization program. This study determined that a pre-plant charge of 0.06 $kg{\cdot}m^{-3}$ (0.10 $lbs{\cdot}yd^{-3}$) phosphate-P (equivalent to 1.2 $lb{\cdot}yd^{-3}$ single superphosphate) with 20% leaching will maintain the necessary substrate solution phosphate-P level of ≥ 3 $mg{\cdot}L^{-1}$ (ppm) for nearly six weeks in the winter. The shift from slower growth in winter to desirable spring growing conditions reduced longevity by only four days. When the application of 20% excess water or fertilizer solution (leaching) at each irrigation was increased to 50%, longevity decreased modestly by four days in winter and six days in spring.

Poultry Litter Ash

Poultry Litter Ash Rate and Placement Affect Phosphorus Dissolution in a Horticultural Substrate. Daniel E. Wells, Jeffrey S. Beasley, Edward W. Bush, and Lewis. A. Gaston. *Journal of Environmental Horticulture* 35(3):117–127.

The decline in domestic and global phosphate rock ore reserves may necessitate the adoption of alternative, environmentally-sustainable phosphorus (P) sources for nursery and greenhouse crop production. Previous experiments have shown that poultry litter ash (PLA) supplies adequate concentrations of P to short-term greenhouse crops, improves substrate pH, and reduces P losses compared to a highly water-soluble P source. In the current experiment, application of PLA as a topdressing did not result in lower plant growth parameters in every case, but did result in less flowering and plant P uptake compared with incorporated application of PLA as a substrate amendment. Reduction in plant P uptake resulting from application of PLA as a topdressing compared to application of PLA as a substrate amendment was most likely the result of limited interaction between plant roots and PLA. It is believed the interaction of plant roots is one of the primary mechanisms for P release form PLA. Reductions in P loss concentrations of 5.0 $mg{\cdot}L^{-1}$ (5 ppm) P, achieved through PLA topdressing, are negligible compared to previously reported reductions in P losses when replacing water-soluble P sources with PLA. Therefore, topdressing is not recommended as the primary application method of PLA due to lower plant growth and quality. For greenhouse crop container production, PLA should be pre-plant incorporated within the substrate at rates (as total P) between 140 $g{\cdot}m^{-3}$ (0.4 $lb{\cdot}yd^{-3}$) and 280 $g{\cdot}m^{-3}$ (0.8 $lb{\cdot}yd^{-3}$).

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