

Final Project Report to the NYS IPM Program, Agricultural IPM 2000 – 2001

Title: Monitoring root system health in Capital District Poinsettia Greenhouses.

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Cooperator(s): Margery Daughtrey, Cornell University

Type of grant: Cultural Methods; sanitation, physical controls and systems comparison.

Project location(s): Commercial greenhouses. (1) operation located in Albany County, (2) operations located in Rensselaer County (1) Located in Schenectady County. In addition the microbial products were also trialed in the Schenectady County Horticultural Training Facility, Schenectady, NY.

Abstract: Poinsettia growers suffer considerable losses from root disorders of poinsettias. This project will demonstrate the improvement in quality and reduction in fungicide use that can be achieved through the use of rootzone monitoring in poinsettia crops. It will also evaluate the effectiveness of two microbial products for the prevention of pythium in poinsettia production.

Background and justification: During the 1999 and 2000 poinsettia production seasons several Capital District growers experienced significant losses from root problems. A recent survey of New York State growers indicated that 79 % applied pest control measures according to information obtained through scouting. Although this is probably true for insect pests, root rot diseases are often present in poinsettias but not recognized until significant wilting occurs. At this point most of the fungicide drenches available are not curative in nature and many are under scrutiny by the FQPA. Previous work on management of the poinsettia root zone by staff in Erie and Orange Counties has taught us that the key to minimizing losses from root zone problems is to provide proper cultural conditions, reduce fungus gnat populations and properly identify diseases followed by proper use of control measures. Capital District growers can realize significant improvements in the quality of crops and minimize the number of fungicide drenches by monitoring root systems and evaluating the suitability of microbial products in their own production settings.

Objectives:

1. Implement root zone scouting procedures with three growers who have experienced significant crop losses from root zone problems in the past two seasons.
2. Reduce the number and frequency of fungicide drenches during the poinsettia production season.
3. Demonstrate the potential role of microbial products in minimizing root rot in poinsettias.
4. Evaluate the quality of the poinsettia crop; document losses to pathogens and compare to previous crops and compare 2001 fungicide use to prior years.

Procedures:

1. Late in the winter of 2001, approach three growers that have experienced root zone problems in poinsettias and document crop losses and fungicide use during the past two seasons. Early in the summer meet with growers to familiarize them with scouting and

evaluating root systems. Before poinsettia production begins meet with growers to insure that water, nutrient and media solution tests have been completed and establish guidelines for managing nutrient and moisture levels during production. Work with growers to implement sanitation procedures as necessary. Assist growers with planning and implementation of scouting procedures for fungus gnats. Visit participating growers weekly and to assist them in scouting and monitor pH and soluble salts levels in crops. Root systems will be evaluated based on the standards published in the Cornell Bedding Plant IPM Manual. Develop a notebook and crop guidelines specific to the grower.

2. When scouting indicates a root pathogen, assist the grower with identification of the pathogen and selection of an appropriate control method. Provide the grower with a detailed format for reporting the control measures utilized. After the control measure has been implemented, evaluate its effectiveness.
3. Two microbial treatments (Root-Shield and Myco-Stop) will be evaluated and compared to traditional management programs and control groups of traditional treatments and no fungicides will also be compared.
4. At the end of the poinsettia season meet with each grower to document the quality of the poinsettia crop and compile data on plant losses and fungicide use. Report these results at a poinsettia school to be held in the summer of 2002.

Results and discussion:

Objective 1 and 2 - Implementation of Rootzone Scouting Procedures and reduction of fungicide use. We were successful in implementing rootzone scouting procedures in three operations and had several good opportunities to interact with the growers, managers and employees. One particular success was educating one of the growers about the life cycle of the fungus gnat, how to monitor for it using sticky cards and potato discs. We also identified ammonium nitrogen toxicity in one of the operations early in the season. We feel that this was due to a number of circumstances coming together at the wrong time. These were over application of fertilizer followed by cold night temperatures and excessive moisture in the rootzone. This condition was confirmed by media and tissue analysis. The problem was confined mostly to dark red cultivars with whites and pinks seeming to be affected far less. In this operation we applied no fungicide drenches since the root systems were stressed from the high ammonium levels. Some plants were lost to fungus gnats but losses were down significantly from 2000.

At the other two operations we identified pythium and fungus gnat problems that warranted control on several occasions. Fungicide use was reduced from 2000 but primarily due to the fact that the cuttings purchased in 2001 were cleaner and better quality than in 2000.

Objective 3- demonstrate the potential role of microbial products in minimizing root rot in poinsettias. In two of the commercial operations and at the Schenectady County Horticulture Education Center we saw no difference in the quality of the root systems between the controls, Mycostop and Plantshield drenches. In the operation where the ammonium toxicity occurred the plants treated with a Plantshield drench had slightly better root system ratings all season and the plant quality was better until about October 15th when the plant growth evened out. The plants treated with Plantshield had slightly more root mass and more white roots than the other treatments.

Objective 4 - Evaluate the quality of the crop as compared to 2000. Two of the three growers were very pleased with the improvement in crop quality. Most of this can be attributed to the better quality cuttings received in 2001. The grower who experienced the ammonium toxicity problem had fewer losses in 2000 and the quality of the crop was better and with some changes in cultural conditions there still is significant room for improvement.

Final Impressions: It appears that in one instance the microbial product provided some degree of protection to the poinsettia root system. However, these results only appeared in a situation where cultural factors such as moisture level and fertilizer rates were not maintained within the proper ranges. The most significant improvements to poinsettia crop quality can be achieved by inspecting cuttings upon arrival, tuning the cultural conditions such as watering, fertilizing and height management and implementing programs to monitor and manage insects and disease pathogens before they become a problem in the crop. It would be useful to growers to compile a set of best management practices for poinsettia crops grown in New York State in the future.