Ornamental Section

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STATUS OF BEST MANAGEMENT PRACTICES FOR CONTAINER NURSERIES

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Abstract. **Best Management Practices (BMPs) provide guidelines pertaining to fertilization and irrigation practices so nurseries, trade associations, and governmental agencies have a common reference regarding the environmental impact of commercial plant production.**

Best Management Practices (BMPs) are not a new concept. For many years farmers have used crop rotation and incorporated organic matter in soil to improve soil structures and fertility. These are just two examples of the multitude of environmentally conscious agricultural practices used in the past that are still used today. However, just using environmentally conscious agricultural practices is not enough. We must communicate the use of environmentally conscious production practices to those not familiar with agriculture. In the past, our society was agrarian, competition between urban and agricultural farmland was minimal, communication was not as rapid as today, and society's concern for the environment did not seem to be a priority. But today, urban sprawl has occurred at unprecedented rates, communication speed has increased, and society questions what is occurring around them and how it impacts the environment. This makes it important for producers of agricultural commodities to be proactive and communicate the positive environmental benefits of their management practices.

BMPs provide a standardized terminology for nurseries, trade associations, governmental agencies, and others to use when communicating about environmentally conscious production practices such as cyclic irrigation and use of controlled-release fertilizer. Cyclic irrigation involves several applications of small amounts of water instead of one large irrigation application. This results in water and fertilizer conservation. Similarly, controlled-release fertilizer minimizes leaching of nutrients over an extended time. These BMPs may not be new concepts when we consider that in the past watering plants was such a laborious task that excessive water was not applied or when we realize the fish buried by Indians next to corn seed provided nutrients for an extended time. But our method of communicating now has a focused terminology, BMPs.

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The Southern Nursery Association (SNA) recognized the importance of BMPs as a vehicle for communicating the proactive environmental consciousness of the nursery industry. In 1994, SNA initiated a process to develop a BMP Guide for irrigation and fertilization of container-grown nursery plants. The process culminated in 1997 with the publication of *Best Management Practices Guide for Producing Container-Grown Plants* (Yeager et al., 1997). Development of this Guide was a major milestone for BMPs in the nursery industry. Not because the Guide was new and did not exist in the past, but because the industry and regulatory agencies reviewed drafts and collectively made input in the BMP Guide the nursery industry would use in the future. The Florida Department of Environmental Protection (FDEP) has subsequently purchased copies of the Guide and contracted with University of Florida to conduct BMP educational programs to help nursery operators implement BMPs. Each participant in the program receives a Guide complements of FDEP.

Another important event in BMP history happened in 1994 when the Florida legislature passed the Nitrate Bill. This Bill provided for a waiver of the cost of remediation of drinking water wells if contamination from nitrates had occurred after voluntary adoption and implementation of BMPs. The Bill provided a provision for funding development of research-based BMPs but also provided for the adoption of interim measures that do not have to be research-based. Interim measures are management practices that producers believe will result in minimal to no environmental contamination. The Florida Nurserymen and Growers Association (FNGA) and Tampa Bay Wholesale Growers are capitalizing on having interim measures for voluntary adoption by Florida nursery operators. A FNGA task force is sifting through the BMPs in *Best Management Practices Guide for Producing Container-Grown Plants* (Yeager et al., 1997) to determine which BMPs are specifically needed for Florida's woody, floriculture and foliage industries. Once this process is complete, the proposed interim measures will be forwarded to Florida Department of Agriculture and Consumer Services for adoption as a rule under the Nitrate Bill. Nursery operators that voluntarily implement interim measures and maintain appropriate records are presumed to be in compliance of not contaminating ground water with nitrate nitrogen and are waived by the State of Florida for the cost of remediation of drinking water wells if contamination occurs.

Proactive nursery businesses of the future will spend more time than in the past accounting for production activities. Being a part of the accountability process during development is very important, whether it's monitoring and recording nutrient applications, irrigation application amount, runoff discharge, or a host of other activities. The interim measure development process currently underway by FNGA offers nurseries in Florida the opportunity to be a part of the process. Draft interim measures will be available in the future and meetings established for discussion and comment. The interim measures of today could be BMPs communicated to the public in the future, so it is vital to develop interim measures that are beneficial and useful for the nursery industry.

Literature Cited

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USE OF SUBIRRIGATION TO REDUCE FERTILIZER RUNOFF

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Abstract. **The growth of areca palm (*Dypsis lutescens* (H.Wendl.) Beentje & J. Dransf.) and philodendron (*Philodendron* Schott. 'Hope') plants was compared between subirrigation and overhead irrigation systems. Plants were fertilized with top-dress application of Osmocote 15N-4.1P-9.96K at 7, 10, or 14 g per pot. The amount of water used by both irrigation systems as well as the amount of nitrate-nitrogen (NO_3-N) lost to the environment from each system also was recorded. Ten times less water was used per square meter of bench space with the subirrigation system than with the overhead system. No NO_3-N was lost to the environment from the subirrigation benches because the irrigation solution was captured and re-used after each watering while the cumulative amount of NO_3-N lost per square meter of bench space from the overhead watered plants by the end of the experiment was1149 mg. For both irrigation systems, plant growth increased as the fertilizer application rate increased. Shoot dry mass of philodendron plants fertilized with 7 or 10 g was greater in subirrigated pots than in overhead watered pots. However, the shoot dry mass of philodendron plants fertilized with 14 g were greater in overhead watered pots. At all fertilization rates, areca palm shoot dry mass was greater in overhead watered pots.**

Conservation of water and reducing runoff of fertilizer salts from greenhouse irrigation systems are concerns for many growers (Elliott, 1990; Evans et al., 1992). The use of a subirrigation system that captures and re-uses the irrigation solution is one method for eliminating greenhouse runoff. Other methods include reducing leaching fractions, changing to substrates with higher water-holding capacities, or changing the type and amount of fertilizer used (Biernbaum, 1992). For example, Broschat (1995) reported that nutrient leaching for spathiphyllum and areca palm plants was highest with the soluble type of fertilizers and lowest for the controlled-release type of fertilizers. The objectives of this project were to grow selected tropical ornamental plants using a controlled-release fertilizer product and to compare the growth of plants grown in a subirrigation system to plants grown using overhead irrigation. A second objective was to compare the amount of water used and NO_3-N leached/captured by a each irrigation system.

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Materials and Methods

In April 1999, liners of areca palm and philodendron 'Hope' were transplanted into 800 ml round pots filled with 50% composted pine bark, 40% Florida sedge peat, and 20% sand (by volume) substrate. At transplanting all pots were top-dressed with Osmocote 15N-4.1P-9.96K (8 to 9 month release) (The Scotts Co., Marysville, OH) at 7, 10, or 14 g per pot. Plants were exposed to air temperatures of 30/21°C ± 3°C day/night.

The three fertilization rates were replicated four times over a total of twelve Ebb-Flow Benches (Midwest GroMaster, Inc., St. Charles, IL). All experiments were arranged as a split-plot with irrigation as the main plot and fertilization rate as the sub-plot. Five pots per species were placed on each of the twelve Ebb-Flow benches. Plants were watered daily by flooding each bench with water to a depth of 2.5 to 3 cm and draining after 10 min. The water in the subirrigation tanks was not changed throughout either experiment. Weekly samples were collected from each subirrigation tank to determine NO_3-N concentrations and then the volume of water used to bring tanks back to initial volume was measured.

Five additional pots per species were placed on one of twelve bench sections with the same pattern as the Ebb-Flow benches. Overhead watered pots were placed in a flat supported 2-cm above the bottom of another flat without holes to collect the leachate. Pots were watered daily using Robert's sprinkler heads set 60 cm above the benches. Each overhead watered plant was watered to establish a 0.2 leaching fraction. Daily leachate samples were collected and poured into a covered 38-L container. Once a week, leachate volume was recorded and samples were collected to determine NO_3-N concentrations.