Ornamental Research News

Central Florida Research and Education Center

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NEW RESEARCH

Effects of N & K Ratios on Growth and Flowering of Three Anthurium Hybrids

Dr. C.A. Conover Center Director, and Dr. R.J. Henny, Plant Geneticist

Anthuriums, grown primarily as a cut flower crop, are valued for their colorful, long-lasting inflorescence. Large leaves and long flower stalks make most anthurium varieties unsuitable for use as potted plants. As a result, limited information about fertilization has been published for anthurium as a pot crop. The current recommendation is 1200 to 1500 lbs N/A/yr with ratios of 1:1:1, N-P-K when plants are grown under 1500 to 2000 ft-c.

An experiment was conducted to determine growth and flowering of three new cultivars of anthurium being developed for the pot market, when fertilized at various N) and K rates, and N:K ratios. On April 20, 1993, tissue-cultured plantlets of three new anthurium cultivars (Cherry, Red, and Lavender) were transplanted, one per pot, into 6-inch pots using a commercial growing medium, amended with a micronutrient mix. Plants were grown in a greenhouse with maximum light intensity of about 1200 ft-c and air temperatures ranging from 65 to 90°F.

The experiment consisted of four nitrogen rates and four potassium rates with 4 replications. Plants were fertilized weekly with liquid fertilizer made from stock solutions. Fertilization rates were N at 900, 1500, 2100 or 2700 lbs/A/yr, K at 900, 1500, 2100 or 2700 lbs/A/yr, and P at 400 lb/A/yr.

New flowers were counted weekly until experiment termination on January 20, 1994. Other data collected at three week intervals and at termination included plant grade, leaf area, plant size and number of new shoots.

Data collected showed that plants grown at the lower N and K fertilizer rates had the highest quality. Not only was plant appearance better at the lower fertilizer levels, but flowering also increased 59 to 85%, depending on cultivar. Delayed flowering, which lengthens crop turnover time, has been a problem with many anthurium cultivars used for pot production. Results from this experiment suggest the flowering problem may be due, in part, to use of excessive levels of fertilizer, particularly nitrogen. Additional research is needed on these cultivars, but based on data presented here, the use of 900-1200 lb N/A/yr from a 1:1:1 ratio fertilizer such as a liquid 20-20-20 or slow release 14-14-14 is recommended.

For further details, see CFREC-Apopka Research Report RH-95-2.

ON CENTER

Fertilizer Recommendations Yesterday and Today

Dr. C.A. Conover

Over the past 25 years, this center has periodically produced a research report titled "Light and Fertilizer Recommendations for Production of Acclimatized Potted Foliage Plants." When research is conducted regarding light and/or fertilizer, whether on new crops or old, the report is updated as the new information becomes available. The most recent recommendations were published as CFREC-A Research Report RH90-1.

Nearly 15 years ago, we conducted limited fertilization research on the anthurium cultivars available at the time, and the results were subsequently included in the report. Recently, however, we conducted research on some new anthurium cultivars (see Conover & Henny article in this newsletter) and have more research on other anthuriums underway. Data from these experiments indicate that much better quality, especially increased flowering, can be achieved with lower fertilizer levels.

From an environmental aspect, lower fertilizer recommendations can help reduce the potential for groundwater contamination, a serious but solvable problem. Also, growers concerns about their crops and the need for more information aware that excessive fertilizer rates can hurt the crop and profits is always at the forefront of our research. These are some of the reasons behind our decision to reexamine the fertilizer recommendations on anthurium and other crops, and why we will continue to conduct research on fertilizer rates and recommendations, and to address the research needs of the foliage industry of Florida.

PLANT PHYSIOLOGY

Factors Affecting Overhead Irrigation - Plant Canopy

Dr. R.C. Beeson

In the March newsletter, pot spacing was discussed as the most important factor in decreasing efficiency of overhead irrigation. The second most important factor is a plant's canopy. For multi-stem or highly branched plants, such as azaleas or pittosporum, a plant's canopy can act like an umbrella, shedding irrigation water toward the outer canopy edges. If a canopy is larger than pot diameter, a substantial percentage of overhead irrigation can be channeled outside the pot. The amount of irrigation actually penetrating the canopy and reaching the media substrate, or percent penetration, is dependent on the leaf area directly above the root ball. As leaf surface area above a pot increases, either through growth or decreased spacing, percent penetration declines. For marketable azaleas and pittosporum, percent penetration ranges from 30 to 70% and depends on species rather than pot size.

This umbrella effect of canopies reduces irrigation efficiency over and above the effect of container spacing. Spacing calculations assume that all of the irrigation falling within the diameter of a pot reaches a root ball. If percent penetration is less than 100%, then the spacing effect must be multiplied by percent penetration to determine the actual efficiency. Changing the spacing of one gallon pots from a pot-tight arrangement to 6-inch spacing alone decreases efficiency from 75% to 20%. If these are marketable azaleas with 55% penetration, then 88% of the overhead irrigation applied would fall outside the pot.

Until recently, it was assumed that canopies of all container ornamentals were umbrella-like; however, canopies of trees and some shrubs have been found to act more as funnels than umbrellas. Live oak, red maple, winged elm and crape myrtle all tend to have greater than 100% penetration once they develop some branch structure at around three to four feet in height. Peak percent captures ranged from 20 to 140% with 12-inch spacings of 3-gallon pots. Yet, with leaf drop in early winter, percent captures fell below 100%. *Ligustrum japonicum* is also a "funneller". For ligustrum, funnelling tended to partially offset the decrease in efficiency due to spacings of 6 to 12 inches. Effects of plant canopies on percent penetration are being investigated further .

EXTENSION CORNER

All You Wanted to Know about Biological Controls, But Were Afraid to Ask

Liz Felter, Multi-County Commercial Horticulturist

Biological control, predators, integrated pest management (IPM) Where does one begin an environmentally-friendly pest control program? Start by scouting the plant material in your production area. Regularly walk the nursery or greenhouse looking for plants that are different from normal. A scout should be looking for anything out of the ordinary leaf spots, insect damage, spray burn or even the presence of naturally occurring predators. Because good record keeping is an important part of an

integrated pest management program, keep accurate records identifying the problem and specify the areas where affected plants were found.

A successful IPM program should include good cultural practices, the use of biological controls (such as predatory insects and mites, and friendly fungus), insect growth regulators, and the use of soap and oil sprays before resorting to chemical pesticides. Some of the most frequently asked questions are: what can be expected from a biological control program? what changes in growing practices will occur? will there be failures? is help available? how much knowledge is needed? and, what are the costs to implement this type of program?

Expectations should include some degree of trial and error, because each IPM program must be custom-fit to an individual nursery or greenhouse. The existing spray program will likely require the biggest change. Growers and owners will have to agree on an acceptable level of pests before treating with a soap and oil spray or other "soft" chemical spray. Improper selection and timing of pesticide application and their residuals are a major cause of failure in a biological control program.

The level of knowledge required is minimal because you only have to know what pest problems exist at your nursery. Help and support is available from your County Cooperative Extension Service Horticulture Agent as well as many of the firms that supply predators. Cost analyses indicate a potential 30-60% decrease over a traditional spray program. However, because each nursery is different, costs and savings will vary with particular management practices. The savings, combined with a decrease in liabilities from using fewer chemicals makes IPM a desirable production tool.

Central Florida Research and Education Center
2807 Binion Road, Apopka, Florida 32703
Telephone (407)884-2034 Fax (904)392-9359
Office Hours 7:30 am until 4:00 pm, Monday thru Friday.
Grower Diagnostic Clinic - Thursdays 1:00 to 3:00pm.
Ornamental Research News - Chris Fooshee, Editor
e-mail (WCF@ifas.ufl.edu)
