



TROPICLINE

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Center Hort News

Meet **Kimberly Klock**, Fort Lauderdale REC's newest horticulture faculty member: *"Since starting my new position at the University of Florida last July, I have begun to build my research program dealing with problems in bedding plant production. Currently, I am evaluating the efficacy of using composted waste products (e.g. biosolids and yard trimmings) as a growing medium for bedding plants. Results from an experiment conducted in Fall 1995 indicated that impatiens grew as well as or better in mature compost compared to traditional growing medium. I also am evaluating the use of grow regulators (Bonzi as a drench) on impatiens grown in compost. In addition to the compost work, I am cooperating with Dave Clark in Gainesville on investigating Mn and Fe toxicity problems noticed in 'Yellow Diamond' and 'Dark Charm' chrysanthemums. I also am cooperating with Tim Broschat on a project that will investigate the cultural techniques for growing plants in ebb and flow (subirrigation) systems. This fall, I hope to begin work on the effects of selected cultural practices on flower initiation and development in bedding plants, specifically New Guinea impatiens and marigold."* Dr. Klock also teaches a number of courses in the horticulture degree program at the Center. **George Fitzpatrick** was awarded a Teaching Improvement Program Award by the University, and the Rufus Chaney Award for Research Excellence from The Composting Council. **Edwin Duke** was named IFAS Undergraduate Teacher of the Year. **Alan Meerow** received a Faculty Superior Accomplishment Award.

Center Hort Research

PLANTING DEPTH AFFECTS SURVIVAL, ROOT GROWTH, AND NUTRIENT CONTENT OF TRANSPLANTED PYGMY DATE PALMS.

Mature pygmy date palms (*Phoenix roebelenii*) having a minimum of 90 cm of clear trunk were transplanted into a field nursery at their original depth or with 15, 30, 60, or 90 cm of soil above the original rootball. Palms planted at the original level or with the visible portion of the root initiation zone buried had the largest canopies, highest survival rates, and lowest incidence of Mn deficiency 15 months after transplanting. Palms planted 90 cm deep had only a 40% survival rate, with small, Mn-deficient canopies on surviving palms. Palms whose original rootballs were planted 90 cm deep had very poor or no root growth at any level, but had elevated Fe levels in the foliage. None of the deeply planted palms produced any new adventitious roots higher than 15 cm above the visible portion of the root initiation zone.

REFERENCE: Broschat, T.K. 1995. *Planting Depth Affects Survival, Root Growth, and Nutrient Content of Transplanted Pygmy Date Palms. HortSci. 30:1031-1032*

RELEASE RATES OF SOLUBLE AND CONTROLLED-RELEASE POTASSIUM FERTILIZERS

Release rates for 13 commercially available soluble and controlled release K fertilizers were determined in sand columns at 21C. Potassium chloride, potassium magnesium sulfate, and potassium carbonate were leached completely from the columns within 3 or 4 weeks. Osmocote 0-0-46, Multicote 9-0-32, the two S-coated potassium sulfate products, and Nutricote 2-0-37 Type 180 all had similar release curves, with fairly rapid release during the first 20 to 24 weeks, slower release for the next 10 to 12 weeks, and virtually no K release thereafter. Potassium release from Osmocotes 0-0-44 and 0-0-45 and Polyon potassium sulfate occurred very slowly over a 2- to 3-year period.

REFERENCE: Broschat, T.K. 1996. Release Rates of Soluble and Controlled-Release Potassium Fertilizers. *HortTechnol.* 6:128-131.

FERTILIZATION RATE AFFECTS PRODUCTION AND POSTHARVEST QUALITY OF INDONESIAN WAX GINGER FLOWERS

Greenhouse-grown Indonesian wax gingers (*Tapeinochilus ananassae*) were fertilized with 1110, 2220, or 4440 g of Osmocote 17-7-12 per square meter per year for 4 years. Plants receiving the medium rate of fertilizer produced the most flowers, while the highest fertilization rate resulted in the fewest. Flower stalk length decreased each year after planting, but cutting back the vegetative shoots to the ground in August resulted in increased flower stalk length the following year. Fertilization with the highest rate resulted in reduced flower postharvest life, but floral preservatives and ethylene inhibitors had no effect on postharvest life.

REFERENCE: Broschat, T.K. 1995. Fertilization Rate Affects Production and Postharvest Quality of *Tapeinochilus ananassae* Flowers. *HortSci.* 30:1013-1014.

CHEMICAL AND BEHAVIORAL ECOLOGY OF PALM WEEVILS

Palm weevils in the subfamily Rhynchophorinae (Curculionidae) (*Rhynchophorus* spp., *Dynamis borassi*, *Metamasius hemipterus*, *Rhabdoscelus obscurus*, and *Paramasius distortus*) use maleproduced aggregation pheromones for intraspecific chemical communication. Pheromones comprise 8, 9, or 10 carbon, methylbranched, secondary alcohols. (4S,5S)4Methyl5nonanol (ferrugineol) is the major aggregation pheromone for *R. ferrugineus*, *R. vulneratus*, *R. bilineatus*, *M. hemipterus*, and *D. borassi* and a minor component for *R. palmarum*. (5S,4S)5Methyl4octanol (cruentol), (3S,4S)3methyl4octanol (phoenicol), and (4S,2E)6methyl2hepten4ol (rhynchophorol) are the main aggregation pheromones for *R. cruentatus*, *R. phoenicis*, and *R. palmarum*, respectively. Plant kairomones strongly enhance pheromone attractiveness but none of the identified volatiles, such as ethyl acetate, ethyl propionate, or ethyl butyrate are as synergistic as fermenting plant (palm or sugarcane) tissue. Studying orientation behavior of foraging weevils to semiochemical devices helped to design and test traps for weevil capture. Generally, 3 mg/d of synthetic pheromone (with nonnatural stereoisomers being benign) plus insecticidetreated plant tissue constitute highly attractive trap baits. Potential exists for pheromonebased masstrapping of weevils to reduce their populations and the spread of the weevilvectored red ring disease, for monitoring their population dynamics to facilitate pest management decisions, and for detection and possible interception of nonnative weevils at ports of entry.

REFERENCE: GIBLIN DAVIS, R. M., A. C. Oehlschlager, A. Perez, G. Gries, R. Gries, T. J. Weissling, C. M. Chinchilla, J. G. Peña, R. H. Hallett, H. D. Pierce Jr., and L. M. Gonzalez. 1996. Chemical And Behavioral Ecology Of Palm Weevils. *Florida Entomologist: in press.*

OPTIMIZATION OF SEMIOCHEMICALBASED TRAPPING OF METAMASIUS HEMIPTERUS SERICEUS (OLIVIER) (COLEOPTERA: CURCULIONIDAE)

Response of adults of the West Indian sugarcane weevil, *Metamasius hemipterus sericeus*, to various semiochemical treatments and physical trapping parameters was studied in southern Florida in fieldgrown banana and Canary Island date palms. Ethyl acetate released alone at 8601007 mg/day was as effective for the capture of *M. h. sericeus* as a combination of ethyl acetate (844919 mg/day), ethyl propionate (348362 mg/day), and ethyl butyrate (117137 mg/day) and in one trial was more effective than fermenting sugarcane (250 g), ethyl propionate alone (353384 mg/day), ethyl butyrate alone (123174 mg/day), or no treatment. Ethyl acetate released alone at 675683 mg/day was as attractive as 250 g of fermenting sugarcane or the racemic blend of the maleproduced aggregation pheromones (5methylnonan4ol and 2methylheptan4ol [8:1 ratio] "metalure") at 3 mg/day. Weevil counts increased with all three possible binary combinations of ethyl acetate, sugarcane, and/or metalure compared with these semiochemical treatments alone, whereas the ternary combination increased trap efficacy 23 times over any of the binary treatments. Attraction to ethyl acetate released alone at 777 mg/day

with metalure was greater than to the hydrolysis products of ethyl acetate (ethanol and/or acetic acid each released at about 68 mg/day) with metalure. Weevil counts from traps baited with 250 g of sugarcane and metalure increased with increasing dose of ethyl acetate up to about 400 mg/day where the counts leveled off through about 1660 mg/day. Weevil counts from traps baited with ethyl acetate (about 700 mg/day) and metalure increased with increasing amounts of sugarcane (02 kg). Molasses (45 g) + water (158 ml) substitutes for sugarcane were about as effective for capturing *M. h. sericeus* as 250 g of fermenting sugarcane (all treatments with ethyl acetate [847 mg/day] and metalure). Early experiments used a lethal pitfall trap. We demonstrated that several alternative trap designs were more effective than the lethal pitfall trap for capturing weevils. Height of trap (up to 1 m high) and color did not affect trap efficacy when baited with the ternary combination of ethyl acetate (672825 mg/day), sugarcane (250 g), and metalure.

REFERENCE: GiblinDavis, R. M., J. E. Peña, A. C. Oehlschlager, and A. L. Perez. 1996. *Journal of Chemical Ecology: in press.*

EVALUATION OF AN ENTOMOPATHOGENIC NEMATODE AND CHEMICAL INSECTICIDES FOR CONTROL OF METAMASIVUS HEMIPTERUS SERICEUS (COLEOPTERA: CURCULIONIDAE)

Several chemical insecticides and the entomopathogenic nematode, *Steinernema carpocapsae*, were evaluated for efficacy against the West Indian sugarcane weevil, *Metamasius hemipterus sericeus*, in laboratory and field tests. Three different bioassays and a field study with sugarcane demonstrated that *S. carpocapsae* were efficacious against larvae but not adults of the weevil. These bioassays also demonstrated that adults of *M. h. sericeus* were killed by labelled rates of commercial formulations of acephate 75WP, carbofuran 2F, chlorpyrifos 4EC, cyfluthrin 2EC, disulfoton 15G, imidacloprid 2F, isofenphos 2I, lindane 25WP, and Vydate L. In a field test with weevil-infested Canary Island date palms, *Phoenix canariensis*, lindane (25 WP, 1.5 g AI/palm) and imidacloprid (75 WP, 1.2 g AI/palm) had the greatest effect on the percentage mortality of total weevils present per palm (>60%) followed by *S. carpocapsae* (8 X 10⁶ infective juveniles [IJs]/palm)(51%) and acephate (2.9 g AI/palm) (39%) which were statistically equal to the controls (14%). Control palms harbored over 200 *M. h. sericeus* per tree in the petioles and stem periphery. Because of the potential for high weevil production per palm and the cryptic habitat of the boring stages of this weevil, chemical insecticides and/or entomopathogenic nematodes will need to be applied frequently and over a long period of time for effective management.

REFERENCE: Giblin-Davis, R. M., J. E. Peña and R. E. Duncan. 1996. *Evaluation of an Entomopathogenic Nematode and Chemical Insecticides for Control of Metamasius hemipterus sericeus (Coleoptera: Curculionidae).* *Journal of Entomological Science: in press.*

STUDIES OF INSECT PESTS OF WEST INDIES MAHOGANY (SWIETENIA MAHAGONI)

The insect pests of mahoganies include a webworm (*Macalla thyrsoalis*), a leaf miner (*Phyllocnistis meliacella*), and a shoot borer (*Hypsipyla grandella*). We have found that neem extract (azadirachtin) applied to the foliage at label rates effectively controls the webworm and the leaf miner of mahogany, and sometimes controls shoot borers. Shoot borers in general are among the most difficult insects to control consistently, partly because of lack of knowledge of their bionomics. In studies of the bionomics of mahogany shoot borers it was found that they attacked the seed capsules of West Indies mahoganies in spring (March - April) after the latter dehisced and the seeds were exposed, which occurred prior to flushing. The seeds apparently preferred over shoots as a food source and 50-96 % of the seeds in capsules examined in June were damaged by larvae. The shoot borers don't attack the seeds while the seed pod is growing (May-following March), but only when it opens and exposes the seeds. When mahogany trees are used as a seed source, the seed pods should be protected from these insects. A method of control of this insect with biorational chemicals is being developed.

INVESTIGATOR: F. W. Howard

RELATIVE SUSCEPTIBILITY TO LETHAL YELLOWING (LY) OF 2 SPECIES OF VEITCHIA PALMS

The results of a field test in Florida to compare the susceptibility to lethal yellowing (LY) of 2 species of *Veitchia* palms were that 91.9 % of *V. merrillii* and 19.3 % of *V. montgomeryana* contracted LY. Thus, *V. merrillii* is apparently highly susceptible and *V. montgomeryana* moderately susceptible to LY.

INVESTIGATOR: F. W. Howard

HOST PREFERENCES OF THE PALM LEAF SKELETONIZER

The palm leaf skeletonizer, *Homaledra sabalella*, is known in Florida and Puerto Rico. Damage by this insect to coconut palms (*Cocos nucifera*) has been particularly severe in recent years. This insect infested nine of 20 palm species that were examined. The highest populations were on coconut. Moderately high populations were on *Livistona rotundifolia* and *Washingtonia robusta*. Comparisons of infestations of coconut palm and six other species of palms indicated that this insect prefers coconut palm.

INVESTIGATOR: F. W. Howard

GROWTH OF HIBISCUS IN MEDIA AMENDED WITH A CERAMIC DIATOMACEOUS EARTH GRANULE AND TREATED WITH A KELP EXTRACT

Axis (AgroTech 2000, Plainsboro, N. J.) is a kiln-fired diatomaceous earth aggregate produced from diatomite deposits. It is inert and has a pH of 7. Its porous nature reportedly absorbs more than 100% of its own weight in water, then releases the water to the surrounding soil as the soil's water content drops below field capacity. Used as a container media amendment, Axis might allow plant production using less water without loss of quality. Kelp by-products have been reported to stimulate plant growth in various ways. Growth of *Hibiscus rosa-sinensis* L. 'President' under daily irrigation and decreasing irrigation frequency was compared in a 5:4:1 (v:v:v) pine bark/sedge peat/sand medium amended further with 0, 10, 20 or 30% (volume) Axis, a kiln-fired diatomaceous earth granule. Half of each substrate treatment also was drenched three times with Agroroots, a kelp extract. Shoot and root dry weights were compared after 4.5 months of growth. Container media amended with Axis at 10% volume yielded hibiscus plants with higher shoot dry weights than non-amended media. Root zone drenches with Agroroots produced shoot dry weight increases for plants subjected to decreasing irrigation frequency and grown without Axis, but had no significant effect on plants receiving daily irrigation. Shelf life effects of Axis treatment revealed that all plants reached the permanent wilting point five days after cessation of daily irrigation. Both products may have value in allowing container plant production with less irrigation. Further tests are underway with other species of ornamental plants.

REFERENCE: Meerow, A. W. and T. K. Broschat. 1996. Growth of hibiscus in media amended with a ceramic diatomaceous earth granule and treated with a kelp extract. *HortTechnology* 6: 70-73.

WHITE BAT-FLOWER, TACCA INTEGRIFOLIA, RELEASED TO THE FLORIDA FOLIAGE INDUSTRY

The genus *Tacca* consists of long-lived, short stemmed, rhizomatous or tuberous herbaceous plants that grow in the shade of Asian rain forests. Four species of Asian *Tacca* have attractive, entire leaves, vertical growth habit, and strange whisker-like (filiform) bracts below the flowers that can hang down for as much as 1 foot in length. It is these structures and their accompanying cluster of luridly colored flowers that has given rise to the sobriquet "batflower" for these marvelous tropical plants. Unlike its better known close relative, *T. chantrieri*, *T. integrifolia* has white bracts hovering over the nodding flowers. The bracts are beautifully veined with purple. The rhizome of this species grows vertically and the crown of large, attractive leaves emerge from the top of the rhizome. The leaves superficially resemble those of some Peace lilies (*Spathiphyllum*), but the resemblance ends when the flowers begin to appear. The good news for foliage producers in Florida is that large plants of the white batflower can be finished in just over 1 year from seed. The white batflower fits into any foliage production scheme with ease. The plants thrive in 70-80% shade, high temperatures, and even moisture. White batflower is remarkably free of pest and disease problems. Caterpillars, snails and slugs may occasionally feed on the leaves, but the damage is minimal. Flowering seems to begin when the plants have produced 2-3 full-size leaves. The season lasts from May to November. Large, flowering-size plants of *Tacca integrifolia* were distributed to foliage nursery contributors to the University of Florida Foundation-SHARE program last year. Packets of seed will be available later this year.

REFERENCE: Meerow, A. W. 1995. *The Year of the Bat. Landscape and Nursery Digest* 29(11): 18-19, 69.