Sponsored Student Program

EARLY-FLOWERING, EARLY-RIPENING BLUEBERRY GERMPLASM FOR CENTRAL-FLORIDA ADAPTATION

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Blueberry germplasm at the University of Florida Horticultural Unit in Gainesville, was evaluated for possible adaptation to more southern regions of the state than where blueberries are currently being grown. The impetus for these evaluations is primarily a marketing one; by adding two weeks to the season prior to May 1, Florida would have the only ripe blueberries in the country for several weeks. Problems involved with developing varieties that ripen this early include inadequate fruit development periods and temperatures after flowering that are sometimes too cool for fruit development in the short available period. Another necessary characteristic is synchronous dormancy release of leaf and flower buds in order to provide the best possible frost protection and berry quality.

Seedlings that were evaluated resulted from crosses that combined early leafing, early flowering, early ripening and high fruit quality. The three most promising crosses were those backcrosses of the type a) (highbush x *Vaccinium darrowi*) x highbush; b) (highbush x *V. darrowi*) x *V. darrowi*; c) (highbush x *V. darrowi*) x *V. ellioti*. The most promising of these three is the cross where both parents are highbush types and are lowchill requirement selections themselves. Theses clones ripen approximately 14 days prior to 'Sharpblue' reaching the commercial first picking stage about April 20.

THE 'FALLGLO' CITRUS HYBRID IN FLORIDA

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'Fallglo' citrus hybrid was developed through the USDA breeding program from a 1962 cross and has since been released this year as a new cultivar. The 'Fallglo' citrus hybrid displays fruit and growth habits similar to the 'Temple' cultivar. 'Fallglo' trees are moderately resistant to sour orange scab. The cold hardiness of 'Fallglo' has not yet been fully determined, but it seems to be cold sensitive. There have also been observations of some die back problems associated with this cultivar.

The advantages of 'Fallglo' are that there are less fruit plugging than with other mandrins, early ripeness, deep orange color, and high juice content. The calyx on 'Fallglo' remains in place which reduces the incidence of fruit plugging this eliminates the need for fruit clipping associated with the other mandrin types. 'Fallglo' fruit comes into production from late October to about the third week of November. The solids to acid ratios range from 11.00 in October to 12.30 in November. The fruit itself has a deep orange color early in the season with juice content values of around 65.80%. Fruit production and fruit size were similar for a range of rootstocks used in the breeding program.

OUR MISUNDERSTOOD MAHOGANY AND ITS PROBLEMS

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The mahogany tree (*Swietenia mahagoni* (L.) Jacq,), of the family Meliaceae, is native to southern Florida (including the Keys,) where it is called "madeira"), Cuba, the Bahamas, Hispaniola and Jamaica. It is used increasingly in landscaping in southern Florida but with insufficient awareness of its requirements and weaknesses.

The mahogany develops a tail straight trunk, and hard dark wood in hammocks on outcroppings of limestone on the Upper Keys. If close to the shore, it is protected by a fringe of mangroves. On the more humid mainland and poorly drained soil, the wood is pale and not as hard and limb breakage is common. During rainstorms the tree becomes top-heavy and may topple over.

The shootborer, *Hypsipla grandella,* attacks the growing tips of seedlings in nurseries, causing weak wood, low forking, and excessive crowded branching. Invested trees are prone to fungal diseases. Large fungal growths caused by Sphaeropsis sp. have been observed at the base of thick branches that have split off from the trunk. The trunks are usually coated with sooty mold growing on the gummy exudate caused by weevil larvae (*Lechriops floridanus*) feeding under the bark. The adults feed on the leaves. The mahogany webworm shrouds and defoliates mchoganies in spring and the Cuban May beetle scallops and destroys the leaves. Various organisms induce leafspot, witches' broom, canker, gall and root-rot. If culled in the nursery, set out in limestone, 50 ft apart, and regularly sprayed, mahogany trees with their rounded canopies give elegance to streets. But defective, neglected mahoganies in unfavorable sites, become ugly and dangerous.

STREET TREES FOR SOUTH FLORIDA

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South Florida has many opportunities to incorporate a large variety of trees that can be used as street trees. One needs to take into consideration the function of these trees when planning for the street area. According to Frank L. Zickar, there are many functional trees that are available but are not being used. One needs to think about the trees mature breadth and height when planning to avoid problems in the future such as emerging roots and trees interfering with telephone wires and causing visual barriers.

The emerging roots of a large oak tree can be extremely destructive because water pipes and underground wires can be ripped up by the roots. Emerging roots can also break up a sidewalk or a parking area.

Mature breadth and height of a tree needs to be considered when telephone wires are involved. Large trees should not be planted where telephone wires are located and they should also not be planted where they will be a hinderance to a drivers view.

There are many trees that can be used as alternatives to the problem street trees. With proper planning, the designer can determine what is an efficient street tree and what is not. The trees mature breadth and height must be taken into consideration before planting street trees. There are many effective street trees that can be used in South Florida; *the Geiger* tree, Cherry laurel, Jacaranda, Royal poinciana, and most of the palms. South Florida has a superb climate for growing most anything. Good planning is a must to achieve effectiveness in a functional tree, especially if street trees are concerned.

RESHAPING THE FLORIDA CITRUS INDUSTRY

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The following report is a brief summary of the Sectional Workshop on "Reshaping the Florida Citrus Industry". The Florida industry has faced many challenges over the past decade. Destructive freezes, blight, canker, tristeza, more stringent pesticide regulations, and massive foreign competition have combined to force the citrus industry to change. Most of these problems will continue to challenge the industry into the next century, along with labor unavailability, water shortages, and numerous as yet unknown obstacles. Despite all these, Florida citrus growers remain optimistic and by adaption should expand and prosper.

Most new citrus plantings are being located further south than in the past to avoid the colder areas, and remaining growers in freeze-prone areas are adopting special management practices to reduce winter losses. Water availability, urbanization, and soil characteristics are other important factors which should be condidered in choosing a new grove location. Careful selection of scion varieties and matching the rootstock with particular site characteristics will allow the grower to deal with many challenges. Planting top quality trees of the best available budlines is essential for maximizing longevity and profitability. Recent advances in protoplast fusion, genetic engineering, and other advanced techniques offer exciting possibilities for dramatic scion and rootstock variety improvement in the near future.

Citrus groves are now being planted at higher densities in order to maximize returns per unit area. Densities of 400 to 500 trees per acre may soon be common. Precise irrigation, nutrition, weed control, and pest management must also be utilized to maximize profitability. The successful citrus grower will be increasingly required to develop a systems approach to grove management and demonstrate a high level of managerial sophistication. Strong research and extension programs are a valuable means of supplying the knowledge which is necessary for dealing with the challenges to come. Intelligent adaption will provide a bright future for the Florida citrus industry.

THE PAST FREEZE OF THE U.S. GRAPEFRUIT INDUSTRY FROM A FLORIDA AND TEXAS PERSPECTIVE

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In 1983, the Florida and Texas grapefruit industries were severely affected by a freeze. Florida sustained significant tree loss while Texas grapefuit was almost completely wiped out. That freeze did not terminate the industries as Florida replanted and even increased its previous production and Texas rebuilt its industry.

With the experience and knowledge from that freeze, growers in both Florida and Texas can better cope with freezes. Different locations that are less susceptible to freeze damages are being planted as well as methods presently being used that may help trees overcome a freeze. Some factors considered were acreage, tree spacing, varieties and projected grapefruit production which brought about a discussion of the Florida and Texas positions in the U.S. and world grapefruit markets as well as the current and anticipated competition facing Florida and Texas.

SOLARIZATION OF SMALL VOLUMES OF POTTING SOIL FOR DISINFESTATION OF PLANT-PARASITIC NEMATODES

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Homeowners many times use yard soil as part of a potting mix, which commonly introduces plant-parasitic nematodes. Fumigation chemicals available for commercial use are either not available for the homeowner or side effects make their use undesireable. Soil can be cooked in the home oven, but this is a messy job. Solar radiation used to heat soil above the temperature that nematodes can withstand can be used to disinfest for nematodes.

Shallow boxes were constructed and lined with plastic, then filled with coarse sand. Boxes were arranged in an RCB design with 4 replications. Four treatments were used: 1) no plastic covering, 2) one layer of clear plastic, 3) one layer of black plastic, and 4) a double layer, 1 each of clear and black plastic. The nematode ***Bursaphelenchus seani*** was used as a bioassay for effectiveness of solarization using the 4 treatments. Boxes were left on asphalt in full sun for 6 days in May 1987 in Fort Lauderdale, FL.

Nematode survival averaged 98.3, 77.6, 38.1, and 0% for treatments 1, 2, 3, and 4, respectively. Nematode reproductive capability was 100, 100, 75, and 0% for treatments 1, 2, 3, and 4, respectively. Laboratory experments showed that exposure to 48.5 degrees C for 2 hours was enough to cause 100% mortality of the nematode. Homeowners can successfully use large garbage bags with a 2-3 inch layer of soil for the same purpose. This treatment is not effective for control of weeds and bacteria, only nematodes.

CONTAINER SIZE AND POTTING MIX AFFECT GROWTH RATE OF WEEPING FIG AND LOOUAT

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Two individual experiments were conducted to determine the differences container size and potting media make on plant growth. Rooted cuttings of Weeping Fig (***Ficus benjamina***) were grown in 4-, 6-, or 8-inch containers under 80% shade in a glass house for one experiment and loquat liners were grown in 1-, 2- or 3-gallon containers in full sun on white gravel beds. The potting mixture was one of peat: sand: bark (1:1:1 by volume) or a commercially prepared medium of peat, sand, pine bark, vermiculite, and bark ash. Monthly measurements were taken over a four month period. Weeping Fig grew most quickly in an 8-inch container and slowly in th 4-inch container. Loquat thrived in the 3-gallon and grew less in the 1-gallon container. The commercially prepared potting mix increasd plant growth rate over that of the peat: sand: pine bark medium in 5 of 6 container sizes observed.

Osmocote 18-6-12 (9 lbs. per cubic yard) was used in the Weeping Fig as a source of fertilizer. Weeping Fig plant growth increased with the size of the container. The commercially prepared potting mix caused a noticeable difference in plant growth in 4-inch containrs. However, in 6-inch container the difference in rate was not as significant. In 8-inch containers it was barely measurable.

The loquat showed a less dramatic difference in plant growth rate when the two potting mediums were studied. The growth rate was not significantly more when the metromix was used.

The experiments determined that growth rates can be increased with a change in potting medium. Growers can increase production of Weeping Fig more easily with this change than loquat, however, money will be saved in the production process of both plant types due to this increased production.

EFFECTS OF SOIL SERIES ON SHALLOW WATER TABLE FLUCTUATIONS IN BEDDED CITRUS

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A concern to citrus growers on Florida's East Coast, is the fluctuating water table combined with restrictive soil layers. The length of time and level at which parched conditions existed were compared at eighteen groves in Indian River and St. Lucie counties. Soil types were Riviera, Winder, Wabasso, Pineda, Chobee, Oldsmar, Nettles and Eau Gallie. At all sites, flood irrigation was used.

Peep wells were sunk to 5 feet and observation wells to the depths of restrictive layers. It was determined that when the well was 22 inches, most of the water was below the beds; however, on Wabasso soil, the water level reached the bed depth of 35 inches. The Chobee soil showed a high water table most of the time, but groves on Riviera soils required frequent irrigation.

Drainout periods in the soils varied from 20 hours on Riviera and Eau Gallie soils, to 40 hours on Pineda, Wabasso and Winder, and 65-75 hours for the others.

The duration of sustained water tables was lowest on Riviera and Wabasso, followed by Winder, which all drained in less than 10 days. In the Pineda soils, the water table never dropped more than 2 feet in the 10-day observation period.

CURRENT AND FUTURE TRENDS IN NEW CITRUS PLANTINGS

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The current and future trend for new citrus plantings in Florida is moving south. Moving south is not new to the industry. However, this trend has been continuing since the industry came to St. Augustine. Recent freezes and the large tracts of land have induced the movement south and made it more feasible to operate. The curren industry is developing in a thirteen county region that stretches from Indian River to Sarasota down to Palm Beach across to Collier County. This area is currently producing 70 percent of the total orange production and 80 percent of the grapefruit production in Florida. This region also maintains the majority of total acreage and production at 60 and 65 percent. As predicted at the 1987 Florida State Horticultural Society meetings, the forecast is that if the movement continues, the center of the Citrus Belt will move south from Polk County to Hendry County in the near future.

CHARACTERIZATION OF GROWTH AND RIPENING OF STRAWBERRY FRUIT *IN VIVO*

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Strawberry (*Fragaria* X *ananassa* Duch cv Pajaro) blossoms were tagged during March and April on 5 dates to monitor and characterize fruit growth and ripening. Plants were grown at IFAS field plots north of Gainesville. Diameter (at maximum) and length of fruit were measured 2 to 3 times per week throughout development from anthesis (flower set) to full ripe. Data for primary, secondary, and tertiary fruit were collected. Days to ripen was negatively correlated with increasing mean air temperature. As air temperature increased (78/51° F, min/max to 88/57° F min/max), time to full ripe decreased from 33 to 23 days. Regardless of temperature, fruit set on the same day required the same time to develop to full ripe, irrespective of fruit position. The growth pattern exhibited was double-sigmoidal for all anthesis dates and fruit positions. The first growth rate peak occurred 6 days post-anthesis and the second peak occured 2 to 3 weeks post-anthesis, as a function of temperature. The data suggest strawberry fruit should be harvested as late as possible in development to guarantee maximum size and quality of berries.

QUALITY OF 'ARKIN' CARAMBOLAS STORED AT DIFFERENT TEMPERATURES

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Carambola (*Averrhoa carambola* L) fruit, also known as star fruit, has gained widespread consumer popularity in recent years. Two types of carambola, sweet and tart, are grown in South Florida. As fruit mature on the tree, the color changes from green to yellow-orange. When picked at yellow-green (breaker), fruit will continue to develop color. Currently, fruit are hand-picked at breaker stage, wrapped in paper and stored at 50° to 60° F until shipped. Unfortunately, little is known about the postharvest effects of storage temperature on carambola fruit quality. The purpose of this study was to determine the best storage temperature for both sweet and tart carambola fruits.

'Arkin' (sweet) and 'Golden Star' (tart) were held at 68°, 59° and 50° F for 30 days. After 30 days at 68° F or at 59° F, fruit of both cultivars were decayed, while fruit held at 50° F were still marketable. The experiment was repeated, using 50° F and 41° F temperatures. After 44 days, less fresh weight was lost from fruit held at 41° F compared to fruit held at 50° F. Although color development was delayed at 41° F, fruit of both cultivars showed no symptoms of chilling injury. Fruit held at 41° F then warmed to room temperature developed a normal yellow color. These studies indicated that storage time can be prolonged without detrimental effects if carambolas are held at 41° F.

INCREASING CROP YIIELDS USING SUPPLEMENTAL TRICKLE IRRIGATION

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The drip system was applied to an existing seepage system with a waste water table 17 inches below the soil bed surface. Soluble fertilizers were placed along the soil bed surface 8 to 10 inches from the bed center. The drip system provided an area of leaching with a strong nutrient gradient from the fertilized area to trickle tube. The concentration salts in the leached area depended on the amount of salt concentration in the drip system. When holding salt concentrations equal or below the danger level in the rhizosphere, crop production was increased greatly. Salts can increase from a number of reasons, including cultural procedures, but the effect of high concentrations of salt in a growing area can be minimized with the use of drip irrigation.

EFFECT OF PLANT GROWTH REGULATORS ON *HIBISCUS ROSA-SINENSIS*

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Hibiscus rosa-sinensis **L., a common landscape plant used in south Florida with characteristically long internodes, has a large market potential as a potted, flowering plant for interior use. Because the plants internode length in outdoor situations detracts from its aesthetic appeal as a floral crop for indoor use, plant growth regulators were applied to reduce growth. The objective of the experiment was to determine which growth regulator, Bonzi (paclobutrazol) or Sumagic (I.S.O. proposed as Uniconizole), was most effective in producing an aesthetically pleasing, potted plant. These growth regulators, which reduce plant cell size, but not cell number, move only upward through the xylem, thus, the roots are not hindered.**

Purchased liners (4-weeks old) of hibiscus variety 'Seminole Pink' were potted in 11.5 cm. diameter containers with a mix of pine bark:peat:sand (5:4:1, v:v:v). Each plant was fertilized with 4gm of Osmocote 18-6-12 slow-release fertilizer and grown in 73% shade. The growth regulators, Bonzi and Sumagic, were applied as a soil drench at 0, 50, 100, and 200 ppm rates. All rates of both regulators tested produced the same amount of plant reduction, as well as, a deeper green color to the leaves over that of the control plants.

Sumagic applied at the 50 ppm rate increased the number of flowers produced, with no reduction in flower size, over that of Bonzi or the controls. Number of flowers produced was unaffected at the higher rates. The Bonzi applications, which increased the number of flowers produced only slightly, were not statistically different from that of the controls. Axillary branching was initiated with all rates of Bonzi, but inhibited with all three rates of Sumagic.

The reason there was no increase in flower number with Bonzi may be due to the pine bark in the media absorbing some of the Bonzi, thus, the regulator was not readily available for plant uptake. Slightly reducing the 50 ppm application rates of either the Bonzi or Sumagic regulator can still produce desirable plants for interior use.

AN OVERVIEW OF TROPICAL FRUIT USES IN FLORIDA

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The marketing potential of tropical fruits in Florida is steadily increasing. The increase of ethnic people in Florida has caused an increase in the demand of the tropical fruits that they used to enjoy in their motherland. The unique shapes, looks, and tastes of tropical fruit have also increased the demand made by tourists and residents. Due to Florida's variable climate and natural resources and to advanced research, more tropical fruits can be seen in the market for longer periods of time.

Tropical fruits look odd to people who are used to more temperate fruit such as apples and peaches. Some of the tropical fruits just do not look as good on the outside as they taste on the inside; therefore, attractive packaging might help to increase sales.

Despite their unfamiliar appearance, tropical fruits are a good source of nutrition. Tropical fruits are high in potassium, low in sodium and high in fiber. These fruits also add more variety to one's diet which is essential to promoting good health.

An effective marketing strategy is to offer ideas on how to use these tropical fruits. Methods of preparation, storage, nutritional value, and handling of selected fruits and vegetables deserves more attention.

A GOOD AND FUNCTIONAL LANDSCAPE

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The title of this summary creates a number of problems within itself. What exactly is a good and functional landscape? There is no exact answer since each landscape is different. However, there are good examples of these types of landscape one such as the subject of Susan Sprunt's paper.

The Dr. Kennedy Home's Housing Project in Fort Lauderdale was the subject and location of Susan's work. Unlike most other experiments or papers given, Susan didn't have to do months of research and data collection. Instead, a multitude of problems confronted her when the project was undertaken.

The first problem was the existing features already on the lot including undesirable plant material. A complete survey and recommendations were drawn up and given to the city. The second problem was the need for low maintenance landscape since it was under city care. The third problem came from a lost sense of secutity by the residents because of a high volume oi undesirable traffic through the complex. The final problem was the need for the landscape to be of good visual quality or, in other words, to be appealing.

To deal with the problems a number of ideas were put to use. By using plants adapted to the environment, maintenance was reduced. Proper placement of Spanish Bayonets reduced traffic and created a more secuure feeling. Visual quality was obtained by a plant mass of various types placed in the center of the complex.

In conclusion, a careful review of this project clearly shows that a great deal of work and planning were expended. Through this work a good and functional landscape was developed for this housing project which will bolster pride in these areas.

THE EFFECT OF WITHHOLDING FE, ZN, AND MN SPRAYS ON LEAF NUTRIENT LEVELS, GROWTH RATE AND YIELD OF YOUNG 'PINEAPPLE' ORANGE TREES

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Dr. Wutscher conducted a study in conjuction with A. Duda and Sons, Inc. to measure the effects of withholding iron (Fe), zinc (Zn), and manganese (Mn) from 'Pineapple' orange trees. Manganese and zinc were omitted on seven rows in a fourteen row block. The remaining seven rows received the standard two nutritional sprays per year containing Zinc and manganese. Iron was withheld for four of the eight year period. Copper was applied or disease control and boron applied to maintain standards throughout both sections.

Leaf analysis conducted between July and October during the period from 1978 to 1986 indicated that low levels of three elements existed in the tree. The nutrient withheld trees showed no visual chlorosis and demonstrated growth equal to that of the control trees. Growth was determined on height and trunk diameter.

The conclusions reached by Dr. Wutscher from this study indicate that two nutritional sprays for Fe, Zn, and Mn is unnecessary and wasteful. One spray per year and possibly one every two years is sufficient for adequate growth.

CITRUS ROOT SYSTEM DEVELOPMENT

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Dr. Castle questioned whether or not it made a difference in root development how a field grown tree is planted. It was obvious by examining his slides that there are various root formations and developments that result from improper planting. Dr. Castle classified the different root system developments as either eccentric or deficient. Eccentric root development was defined as uneven root development both vertically and horizontally. Deficient root development was characterized by shallow roots, fewer roos, and a lesser amount of root fibers. Dr. Castle referred to "J" roots as a condition which occurs when the main tap root of the young tree is pushed upward because of jamming when it was planted.

Dr. Castle explained that these trees were planted in holes made by the traditional type ringer. He designed and built a ringer which produced a small hole in the center of the main hole for the main root to be planted. This ringer can eliminate "J" roots and other poor root development conditions due to quick and careless planting.

SHOULD YOU ROOT PRUNE BROADLEAF TREES BEFORE TRANSPLANTING?

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There is no optimum answer to the question of whether or not one should rootprune; however, we do know success depends on the species and rootball size, as well as time and cost factors.

In transplant more than 90% of a tree's root system stays in the ground outside of the harvestable rootball. Research has shown that pruning initiates regeneration of fine roots which produce a healthier root system, therefore enabling the tree to withstand transplant shock. Since this process severely sets back a tree's growth, it is necessary to root prune only twice before transplant. A second root prune should be timed close to transplant and situated just outside the original pruning cuts yet still inside the harvestable rootball.

Since there is no conclusive evidence in support or opposition to root pruning necessity, it is up to one's own discretion to practice this technique.