

1984 CONFERENCE PROCEEDINGS

WILD FLOWERS

by Charlie A. Lowery

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Golf course architects, golf course superintendents, landscape architects, and garden club members are becoming more interested in using wildflowers in landscapes. The main reason for this is increasing costs for fuel, pesticides, labor, and mowing equipment, and the recent tightening of water restrictions due to limited water supplies. Wildflowers create beauty while reducing these costs.

Twenty years ago, if you wanted wildflowers, you had to dig them from the wild. Ten years ago, a few seed companies were producing a limited supply. Now many companies produce hundreds of varieties of wildflowers. Let's examine why wildflowers are becoming ever more popular.

In the first place, the tremendous growth of wildflower seed companies has come as a result of the newly established requirements of both the Bureau of Land Management and the Forest Service on land reclamation areas. Companies that have excavated large land areas for mining are now required to convert these desecrated areas to natural vegetation. This is accomplished by planting native trees and grasses and wildflowers.

Secondly, an increased interest in highway beautification by various states has also helped to develop the wildflower seed business. Texas has been the leading state in wildflower usage for highway beautification. Such "natural" landscaping had its beginning in that state as far back as the year 1917, when it was discovered that the first vegetation to appear on disturbed land was wildflowers. Today the beauty of the roadsides of Texas is unsurpassed, and has become a point of interest to tourists. The Highway Department sows seeds of bluebonnets, *Lupinus texensis* Benth.; phlox, *Phlox drummondii* Hook; firewheel, *Gaillardia pulchella* Foug.; and plains coreopsis, *Coreopsis tinctoria*, Nutt. Minnesota and Nebraska also have wildflower projects for their roadsides, while in New Mexico the wildflowers occur naturally. The State of Florida does not sow wildflower seeds, but several Texas natives such as phlox, *Phlox drummondii* Hook, and calliopsis, *Coreopsis basalis* (Dietr.) Blake, have naturalized in North Florida. Florida mechanically mows roadsides, avoiding any natural stands of flowers.

One of the main reasons that wildflowers are utilized to such an extent in other areas of the country is that they decrease the expense of landscaping large areas. Average seed costs per acre amount to about \$125 per acre, whereas sodding costs about \$4,000 per acre.

However, the largest saving occurs because wildflowers significantly reduce maintenance costs. In Nebraska, for instance, the once continuous mowing of the roadsides required the expense and labor of 13 people: a foreman, a person in charge of



Black-eyed Susan, *Rudbeckia hirta*

hauling gasoline for the tractors, and 11 people operating mowers. With the change-over from total grasses to grasses and wildflowers, Nebraska now employs only three people who mow part-time. Thirty-eight states have likewise reduced mechanized mowing in the past ten years. One way that this has been accomplished is through reducing the herbicidal rates. For example, Oust (Sulfometuron), used in Florida at a rate of one-quarter ounce per acre, does not kill grass, but rather slows down its growth. When this herbicide is applied in the springtime, mowing becomes unnecessary. In addition to this, the herbicidal application costs only \$3.00 per acre, whereas mowing costs \$12.70 per acre.

The trend now in golf course design is to specify the planting of wildflowers and native grasses. This move began four years ago when the American Society of Golf Course Architects held their annual meeting in Scotland. Golf courses in Scotland, which are several hundred years old, have relied heavily on wildflowers and native grasses. The reason for this became apparent when American architects learned how little was actually spent for mowing, watering, and fertilizing Scottish courses. American golf course maintenance costs as much as \$250,000 per year. Early in this century many of the American courses did follow the Scottish example. However, the trend shifted dramatically when Florida's golf courses, built during World War II, began using vast areas of highly maintained Bermuda turf. Although the neatly manicured appearance is appealing to the eye, maintenance is very expensive. Inflation has sparked the interest of golf course managers in looking for other means of reducing golf course costs.

Not without problems

To say that wildflower usage is without problems would be erroneous. There have been many failures in these projects. Perhaps one of the biggest problems is grasses overtaking the wildflowers, thus inhibiting plant reproduction. Two new grass herbicides, Fusilade (Fluazifop-butyl) and Poast (Sethoxydim) have recently been released which will kill grasses without damaging wildflowers. A trial plot was established using these herbicides to determine whether or not this management

NATIVE WILDFLOWERS OF FLORIDA THAT ARE AVAILABLE FROM SEED COMPANIES

- Black-eyed Susan, *Rudbeckia hirta* L.
- Goldenrod, *Solidago stricta* Ait.
- Gay Feather, *Liatris spicata* Willd.
- Morning Glory, *Ipomea purpurea* (L.) Roth
- Butterfly Milkweed, *Asclepias tuberosa* L.
- Firewheel, *Gaillardia pulchella* Foug.
- Showy Partridge Pea, *Cassia fasciculata* Michx
- Standing Cypress, *Ipomopsis rubra* (L.) Wherry
- Indian Paintbrush, *Castilleja coccinea* (L.) Spreng.
- Lemon Mint, *Monarda citriodora*, Cerv.
- Blue Sage, *Salvia azurea*

tool would be instrumental in more successful wildflower stands. Results are inconclusive at this time.

Another drawback to wildflowers on golf courses and highways is the attitudes of people in accepting a non-manicured look.

It is important to remember that only ten wildflower varieties native to Florida have been found available through seed companies by this author. Forty-two varieties that will naturalize here but are not native are available through seed companies, however.

SOUTH FLORIDA WILDFLOWERS Candidates for Cultivation

by Chuck McCartney

A lifelong Floridian, Chuck McCartney is a newspaperman and a specialist in Florida's orchids. He says, "My grandmother came to Homestead in 1918, my mother was born there, and I was raised there as well. Many of the wildflowers I use to illustrate my program and now know botanically I first knew as a child when I roamed the pinewoods and fields around my family home. I used to pick bouquets of these pretty wildflowers and take them to my mother. Now I 'pick' them with my camera and share their beauty with as many others as I can."

Every garden flower was once a wildflower somewhere. Someone fascinated by the beauty of the blooms took the plant in hand and grew it. Later, through careful clone selection and hybridization, the plant's flower size, flower pattern, color, or growth habit were "improved" to incorporate desirable characteristics, breed out negative traits, or extend the variety of plant form.

While the Northerners, Midwesterners and Southerners who populate South Florida bemoan the loss of their beloved lilacs, tulips, hyacinths, daffodils, peonies, camellias or rhododendrons, they all but overlook the wealth of beautiful natural plant material available in the subtropical southern tip of the peninsula.

In recent years, some progress has been made in raising public awareness of native trees such as paradise tree, pigeon plum, satinleaf, et al, and native shrubs such as wax myrtle or the various stoppers. However, gardeners still tend to by-pass the herbaceous wildflowers.

Some few of our wildflowers have made it into cultivation. Buttercup weed, *Asclepias*

tuberosa; blazing star, *Liatris* spp.; and black-eyed susans, *Rudbeckia hirta*, are offered in seed catalogues on a limited basis. Some nurseries specializing in aquatic plants offer such native species as pickerel weed, *Pontederia cordata*; arrow-leaf, *Sagittaria* spp.; and waterlilies, including *Nymphaea odorata*.

Some of our native tropical epiphytes, including such bromeliads as *Tillandsia fasciculata* and such orchids as the cow-horn orchid, *Cyrtopodium punctatum*, have found favor with home growers. The almost endemic onion orchid, *Encyclia tampensis*, is often grown and frequently used in orchid hybridization.

But other than these few examples, it's difficult to find South Florida wildflower species in cultivation. This is curious. It makes me wonder why nobody has done selective breeding with the weedy Spanish needles, *Bidens alba*, to develop a beautiful hot-weather alternative to the Shasta daisy. I wonder why butterweed, *Senecio glabellus*, and flat-topped goldenrod, *Flaveria linearis*, aren't being utilized as the gorgeous annual bedding plants they could be. And why aren't we growing our handsome native *Iris hexagona* var. *savannarum*, which turns the mucky depths of the Big Cypress Swamp into places of beauty each spring?

Listed below are a few of South Florida's beautiful and unusual native wildflowers which I feel have potential as cultivated plants. I am not a gardener nor am I a geneticist, so I cannot state with certainty that selective breeding will improve or overcome negative characteristics of each species so they can become useful additions to the cultivated landscape. However, as a traveler and observer in South Florida's dwindling natural habitats, I can point the way to beautiful species which I feel have potential. It's up to someone more skilled in horticulture to prove their worth.

(The Wildflower List is available from FNPS, 1203 Orange Ave., Winter Park 32789, for \$1.00 and SASE.)

INSECT PESTS AND NATIVE TREES

by Wayne N. Dixon

Dr. Dixon is a Registered Professional Entomologist with the Florida Division of Forestry, Department of Agricultural and Consumer Services.

Many causal agents regularly inflict injury and damage to trees, for example, fire, flood, weather, chemicals, diseases, and animals, to name just a few. Within the animal realm, a general list would include nematodes, mites, millipedes, slugs, snails, birds, rabbits, mice, dogs, livestock, man, and insects. Insect pests are important not only because of the damages to trees per se, but also their high nuisance value to landowners, loss of vegetational aesthetics, and expenditures necessary to prevent or control pest insect damage.

Native Trees

Native trees are damaged by insects. So, too, are exotic trees. In the inescapable war of people and trees versus insects, the advantages lie with having native trees

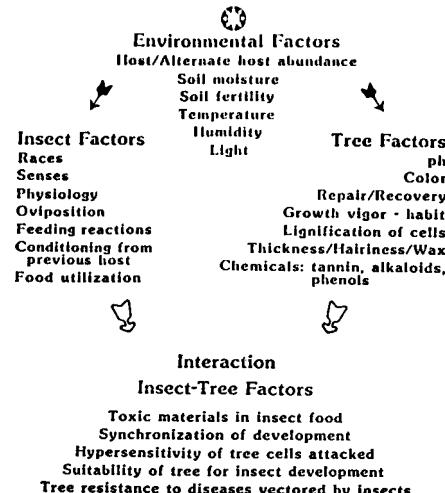
growing under your care and supervision. The advantages are resistance, silviculture, and information on pest biology/habits.

Resistance of a native tree to indigenous pests is more likely to be present than for an exotic tree. Generally, resistance may be expressed in one of the following categories:

1. Preference-nonpreference
2. Tolerance
3. Antibiosis

Briefly, preference-nonpreference is the interaction of tree characters and insect responses that lead to or away from the tree for oviposition, food, shelter, or a mixture. Tolerance is the tree's ability to grow and reproduce itself or repair injury in spite of a damaging insect population. Antibiosis is the tree's characteristics in preventing, injuring, or destroying insect life, for example, reduced fecundity, decreased size, abnormal length of life, and increased mortality. Not necessarily is one type of resistance present to the exclusion of another; often it is a medley of resistance mechanisms. Indeed, the factors that confer resistance are many (Fig. 1).

RESISTANCE



Silviculture of native trees is more likely to be available than for exotic trees. Important areas of silviculture are:

1. Site selection
2. Site adaptations
3. Maintenance programs

Briefly, many tree species have been studied that are native to North America such that the best sites are known for optimal tree growth. If the site is not optimal, however, native trees often successfully modify physiology or structure to adapt to the site. Often, proven maintenance programs are available and adequately tested to yield expected results in tree growth and appearance. The information required to grow desirable trees is extensive and intensive (Fig. 2).

Information on pest biology/habits is another area conducive to growing native trees, not exotic trees. Important categories include:

1. Base information
2. Control methods
3. Predictive capabilities

Briefly, base information or knowledge on general interactions of tree and insect is

SILVICS > SILVICULTURE

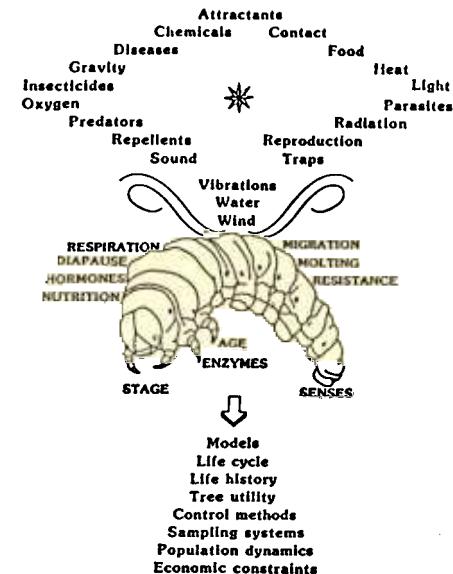
Silvics

Slope
Longevity
Root system
Rate of Growth
Growing season
Shade tolerance
Branching pattern
Tree form, height, shape
Temperature: atmospheric, soil
Atmospheric gases, moisture, wind
Soil fertility, gases, layers, moisture, texture



readily available in many cases of native trees and native pests. Answers are at hand for questions such as: Who is the pest? What damage can be expected? Where will the damage appear? Control methods, tested and efficacious, are available for insect pests of native trees. And, intensive research has provided the capability of predicting insect population responses given known changes in certain parameters, for example, weather, food quality, numbers of insects. Overall, native insects have received considerably more study — as would be expected. This has led to knowledge in several areas (Fig. 3), all of which require years of intensive research, to maximize the probability of suppression of pest insect populations.

PEST BIOLOGY / HABITS



For comparison, a listing of the disadvantages that pertain to exotic trees would include:

1. Little or no information base for many exotic tree species
2. Lack of resistance fine-tuned to one or more native pests
3. Suboptimal sites for tree growth may be all that's available
4. Control measures for pests may be

absent

5. Pest insect-tree interaction little understood
6. Proper maintenance procedures and schedules are not fully developed
7. Absence of natural enemies to contain pest insects and/or prevent exotic tree from becoming a weed.

In general, exotic trees and native trees can be compared in terms of risk of pest infestation. It is greater for exotic trees, less for native trees. And insect damage on a native tree is an identifiable and controllable condition.

Evidence of Insect-caused Damage

There are many clues that can be used to ferret out whether insects are the responsible or causal agents of observed damages to trees. The following table is based on the particular part or component of your tree damaged and the typical damage types that can suggest insect activity. Some words of caution: There are some diseases and other causal factors that can cause similar damage types. A close observation may be necessary.

Insect Identification

Many insects feed on trees. Rather than list the insects, typical damages, and their biology and control, I will refer the reader to two publications available from the Division of Forestry:

Pest and Problems of South Florida Trees and Palms. C.W. Chellman. 1978. 103pp.

Insects and Diseases: Important Problems of Florida's Forest and Shade Tree Resources. E.L. Barnard and W.N. Dixon. 1983. Bull. No. 196-A. 120pp.

Please send your requests to either your local Division of Forestry office or the Bureau of Forest Education, Division of Forestry, 3125 Conner Blvd., Tallahassee, FL 32301.

Consultation with your local county or urban foresters plus referral to these publications should help you identify if an insect is at fault, and appropriate control measures.