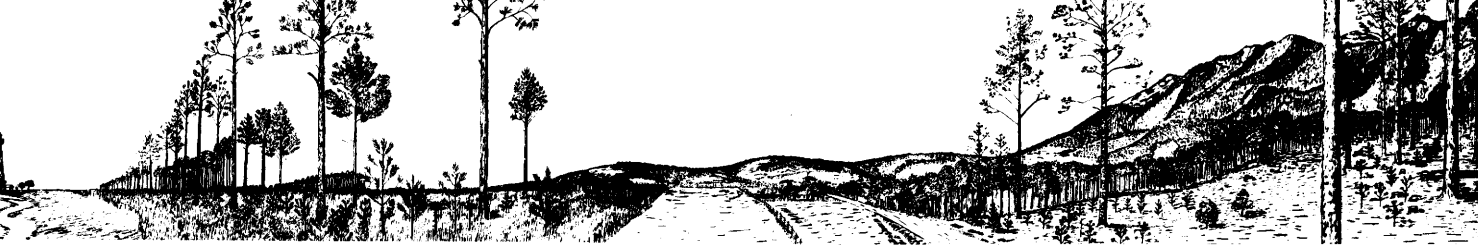

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# CHOPPING AND WEBBING CONTROL SAW-PALMETTO IN SOUTH FLORIDA[1]

Abstract.--Saw-palmetto is one of the more troublesome plants growing in south Florida, and its control is often desirable in programs of range and timber management. Both cross-chopping and webbing (root plowing) proved to be effective control measures, but webbing appeared to be less effective on a moist site. Many other shrubs were also effectively reduced by these treatments.

Saw-palmetto (Serenoa repens (Bartr.) Small) is the major understory shrub over much of the pine flatwoods. It is the dominant shrub on some 8.5 million acres of grazed forest land and 9 million acres of commercial, nongrazed forest land in Florida (4) and is commonly associated with other shrubs over most of the pine-wiregrass type. These shrubs are important competitors with forage and trees for soil moisture, nutrients, light, and space. In dense stands of shrubs, particularly palmetto, yield and availability of forage is decreased, and cattle handling is more difficult. Wildfire is especially damaging to trees where shrubs contribute a large amount of combustible material. Most shrubs also impede planting and harvesting of pines. For these reasons, most land managers seek practical methods of shrub control.

Fire has been used in the South for many years to alleviate these problems (6). Although burning temporarily reduces the size of saw-palmetto, the plants are not killed but readily begin sprouting. These responses to fire are also true of most other southern shrubs. Chemical control of saw-palmetto with herbicides (5, 8) and combinations of fire and herbicides (1, 2) is possible, but results have been variable and relatively expensive. Mechanical methods such as disking, roller-chopping, rootraking, and webbing (a form of root plowing) have given satisfactory control and are commonly used in south Florida, without much knowledge of their comparative worth.

Two of these mechanical treatments, cross-chopping and webbing, utilize different approaches to shrub control. Cross-chopping crushes and partially uproots the plants, whereas webbing severs the stem from

[1] Cooperative study of Lykes Brothers, Forestry Division; Florida Department of Agriculture and Consumer Services, Division of Forestry; and the Southeastern Forest Experiment Station.

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the roots below the soil surface. Because little information on the effectiveness of these treatments is available, a study was conducted in south Florida to determine and compare the effectiveness of cross-chopping and webbing in controlling saw-palmetto and other shrubs.

## METHODS

An area fairly typical of the cutover pine flatwoods of southwest Florida was selected in Glades County for the study (fig. 1). The area had been burned every 2 years and grazed annually for many years. Previously, stands of longleaf pine (Pinus palustris Mill.) and South Florida slash pine (P. elliottii var. densa Little & Dorman) had been clearcut and the stumps removed. Vegetation consisted primarily of saw-palmetto, pineland threeawn (Aristida stricta Michx.), bluestem grasses (Andropogon spp.), and panicum grasses (Panicum spp.), along with numerous forbs and shrubs.

Figure 1.--Typical, untreated vegetation with saw-palmetto and dwarf live oak in the foreground. Pineland threeawn is the dominant grass.

Treatments were applied in early May 1965 on two sites burned the previous winter. The sites were chosen to represent differing conditions of saw-palmetto growth. One was a dry, relatively well drained, upland site with large, robust plants; the other site, which was somewhat lower and wetter, had smaller, more numerous plants.

Cross-chopping and webbing were compared in a randomized complete block design replicated three times on each site. Each plot contained 1.4 acres. Cross-chopping was a twice-over treatment, with the second at right angle to the first, done with a tandem-drum roller-chopper. Webbing was a once-over root plowing treatment done with a V-shaped sweep-blade mounted under a standard road grader. Depth of the blade was adjusted to cut shrub roots about 6 to 10 inches under the

surface with minimum disturbance to the grasses and forbs. Treatments were installed after a light rain while the ground was still moist; for the remainder of May and all of June, however, rainfall was below normal.

Percentage of crown cover and number of stems per acre of all shrub species were determined in November 1965 on two transects located at random in each plot. A 1- by 100-foot transect was used to count shoots of all shrubs other than saw-palmetto. This transect was expanded to 6 by 100 feet for counting palmetto shoots. Any shoot arising from a decumbent palmetto stem was counted; for other shrub species, only stems arising from the ground were counted. Coverage (crown intercept) by species was measured to the nearest 0.1 foot along the center of each palmetto transect. Transects were oriented perpendicular to direction of webbing.

Because response to treatments was similar on both sites, the data were combined for statistical analyses according to techniques suggested by Cochran and Cox (3, pp. 545-567).

## RESULTS AND DISCUSSION

### Species Composition

Fourteen species of shrubs occurred on the transects. Saw-palmetto, dwarf huckleberry (Gaylussacia dumosa (Andrz.) T. & G.), pineland St. Johnswort (Hypericum brachyphyllum (Spach) Steud.), fetterbush (Lyonia lucida (Lam.) K. Koch), lyonia (Lyonia fruticosa (Michx.) G. S. Torr.), dwarf live oak (Quercus minima (Sarg.) Small), and ground blueberry (Vaccinium myrsinites Lam.) occurred on both sites. Species found only on the dry site were gopherapple (Chrysobalanus oblongifolius Michx.), pricklypear (Opuntia sp.), pennyroyal (Pycnothymus rigidus (Bartr.) Small), Seminoletea pawpaw (Asimina reticulata Shuttlw. ex Chapm.), and tarflower befaria (Befaria racemosa Vent.). Gallberry (Ilex glabra (L.) A. Gray) and dwarf waxmyrtle (Myrica pusilla Raf.) occurred only on the moist site, but are also commonly found throughout the pine flatwoods. The most abundant and well-distributed species over both sites were saw-palmetto, fetterbush, lyonia, dwarf live oak, and ground blueberry.

### Species Response

In comparison with the untreated controls, both chopping and webbing significantly reduced the ground cover and number of shrub stems (table 1). Control plots contained a shrub cover of over 50 percent, with about 200,000 stems per acre. Coverage was reduced by the treatments to below 10 percent, with less than 50,000 stems per acre. Cross-chopping was the more effective treatment.

Saw-palmetto was the most important shrub on the area, making up about 65 percent of the ground cover. Chopping and webbing significantly reduced this species (table 1). Chopping of saw-palmetto gave

Table 1.--Crown cover and number of stems of shrubs on sample plots in November 1965 after treatment in May 1965

| Species | Crown cover[1] | | | | Number of stems[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Chopped | Webbed | Untreated | $S_{\bar{x}}$[2] | Chopped | Webbed | Untreated | $S_{\bar{x}}$[2] |
| | Percent | | | | Thousands/acre | | | |
| Saw-palmetto | 0.8[a] | 4.8[a] | 35.2[b] | 1.3 | 2[c] | 14[c] | 24[d] | 3 |
| Other shrubs | .1[a] | 1.5[a] | 19.4[b] | 1.5 | 4[c] | 26[c] | 190[d] | 12 |
| Total | .9[a] | 6.3[b] | 54.6[c] | 1.4 | 6[d] | 40[d] | 214[e] | 12 |

[1]Within a species, means marked with different superscripts are significantly different ($P < 0.05$) by Duncan's new multiple-range test.
[2]Standard error of the mean.

results similar to those reported by Yarlett (9) and Lewis (7). The below-normal rainfall for 6 weeks following treatment may have contributed to the high degree of plant mortality. Webbing was less effective in controlling saw-palmetto because many decumbent stems apparently were able to resprout and overcome root-pruning, especially on the moist site. Cross-chopping appeared to sever the palmetto stem from the roots by crushing and kicking the stem out of the ground and, therefore, tended to be more effective, regardless of soil moisture conditions.

As a group, shrubs other than saw-palmetto responded to chopping and webbing with significantly less cover and stems (table 1). Most individual species showed a similar response. Dwarf live oak had over 50,000 stems per acre, which was more than any other species. Both treatments reduced coverage of this species to negligible amounts, but webbing on the moist site was less effective in killing stems. Also, treatment of lyonia and fetterbush was less effective on the moist site.

Cross-chopping was somewhat more effective in reducing cover and number of stems than was webbing (figures 2 and 3). The effectiveness of webbing was lessened because the operator had difficulty in locating the edge of the last cut with the sweep-blade and, therefore, frequently skipped narrow strips. No doubt, this difficulty will always be present; but, with more careful operation, webbing should be fully as effective as cross-chopping, especially on drier sites.

Six years after treatment, the number of palmetto shoots on the treated plots remained about the same, whereas cover provided by the surviving plants had increased.

## CONCLUSIONS

Cross-chopping and webbing were effective in reducing ground cover of all shrub species, especially saw-palmetto. Webbing was generally less effective than cross-chopping, especially on the moist site; but, with careful operation, webbing may be as effective as cross-chopping except on moist sites.

Figure 2.--Greatly reduced cover of saw-palmetto, pineland threeawn, and other shrubs on the chopped plots.

Figure 3.--Surviving saw-palmetto, dwarf live oak, and pineland threeawn on a webbed plot. Narrow strips were frequently left untreated because of difficulty in judging the edge of the preceding cut of the underground blade.

Species such as saw-palmetto, gallberry, lyonia, and fetterbush have little range or wildlife value and frequently need controlling for range improvement or as site preparation for planting trees. Where wildlife habitat is important, desirable species, such as dwarf live oak, ground blueberry, and dwarf huckleberry, should be given special consideration because chopping and webbing reduce their abundance.

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