Vegetation Management In Florida's Drainage Systems - The Sales, The Service And The Savings

RON WENTZEL

Horticulturist, R. W. Collins Lawn Spraying, Inc.
Weed Control Division
Indian Harbour Beach, Florida

How can it be that a city can save $15,000 a year, cut their drainage ditch maintenance and labor force by 50%, improve public works services and improve community relations all at once? This was all accomplished through a programmed annual weed control service, contracted to chemically maintain 14 linear miles of municipal drainage ditch system. Though it may sound like a "pipe dream," it was simply good business on the part of Rockledge, a city of 14,000 in Central East Coast Florida.

In Rockledge, the maintenance of primary and secondary ditches and channels had become more than just a simple matter of sling blades, back hoes and draglines. The problems grew with the space age technology of the Cape Kennedy Space Center and Brevard County. As pasture lands and citrus groves made way to residential and business development, the drainage problems increased. Newer and more elaborate machinery and an increase in the labor strength during certain parts of the year were required. Ultimately, the above problems were compounded by the need for more efficient control and management of the natural waters. Lake Poinsett and the St. John's River lying to the west of the city have an average elevation of 12 feet above mean sea level; the average elevation above mean sea level of the City of Rockledge is 21 feet. Our preliminary area survey indicated the average ditch to be six feet in depth. This allows a gradient of approximately three feet below the average ditch bottom and the underlying water source. With an average annual rainfall rate of 53 inches, certain outlying, undeveloped areas of the city were continually troubled by light flooding. Also, during periods of heavy rainfall and surface runoff, drainage efficiency was impeded by weed, grass and brush growth by as much as 85%.

With the cooperation of the City Administrator and the Public Works Director, a survey of the city's needs was made, several trial areas were treated to show visual results and a proposal was submitted. The City Council, after discussion and further study, gave its approval to the ad-adoption of our service.

The primary objective of our control program, within this and most drainage systems, is first to eradicate all ditch-bank and bottom weed growth. Secondly, our efforts turn to scheduled maintenance applications designed to maintain clean bottoms, minimize erosion and encourage the regrowth of desirable grasses on ditch slopes. Generally, the regrowth and maintenance of desirable grasses on ditch slopes is the most difficult of the three to achieve.

A complete service and application program will require many considerations which must be made before initiation of the application phase. The two factors on which we place prime importance are the type of vegetation present and the type of terrain and weed environment. The type of vegetation, and its average density and height, will first determine the type of herbicide and amount of solution required for coverage; ultimately, the type of vegetation will dictate the type or method of application. The second consideration, the type of terrain and weed environment, will again influence the choice of herbicide to be used. More important, however, is the direct influence that this requirement places on application techniques, the applicator and the application equipment.

For control and application purposes, we classify the dominant and troublesome species of vegetation into categories according to resistance and methods of control. Generally, broadleaved plants are most prevalent in our area, followed by the perennial grasses and various brush species. Woody vines and briars are normally insignificant in drainage type areas. The broadleaf weeds most common are water hyacinth (*Eichornia crassipes*), water lily (*Nymphaea spp.*) and pickerelweed (*Pontederia cordate*). The perennial grasses most common are common cattail (*Typha latifolia*), paragrass (*Panicum purpurascens*), guinea grass (*Panicum spp.*) and torpedo grass (*Panicum repens*). Those brush species most common are primrose-willow (*Jussiaea peruviana*), common groundsel (*Senecio vulgaris*) and the Myrtle species. The true willows, *Salix*, are generally of minor importance.

Our choice and usage of herbicides is a rather simple and standard one. On the initial treatment of a two spray series, we are normally concerned with the usage of herbicides that will eliminate mixed populations of broadleaf, grassy and brush vegetation. Effective control normally results from the initial application of a 4-lb material of 2,4-D, 2,4-dichlorophenoxyacetic acid (2 pounds active), and 2,4,5-T, 2,4,5-trichlorophenoxyacetic acid (2 pounds active), at 2 to 3 lb/A, 15 to 20 lb/A of dalapon, 2,2-dichloropropionic acid, product and surfactant. On the follow-up treatment, from 1 to 3 weeks later, our chemical approach is influenced by the degree of surviving species present, the general level of control and the condition of the ditch bank. Specifically, the two alternatives are: dalapon at 10 to 15 lb/A of product, 2,4-D-amine (4 pounds active) at 1 to 2 lbs/A plus surfactant or ammonium sulfate with oil and water at 50 lb of product per 96 gal. of water. The usage of ammonium sulfate during the supplemental application, is particularly efficient when maximum abatement, with minimum erosion on ditch banks, is desired. Additional treatments required throughout the contract period are applied, depending on conditions, using either of these three methods. When complete eradication of torpedo grass is necessary, the channels are blocked and treated with bromacil, 5-bromo-3-*sec*-butyl-6-methyluracil, at 24 lb/A. A single annual application of diuron, 3- (3,4-dichlorophenyl) -1, 1-dimethylurai, at 40 to 48 lb/A, is used whenever possible to maintain clean ditch bottoms. We prefer the sterilization of ditch bottoms, however certain factors will influence using this approach. The treated area must be completely free of any desirable trees and

ornamentals and we prefer the area to be dry to muddy during application. In addition, the herbicide cost must be justified by a long term savings in control and application costs.

The type of vegetation will influence the spray volume, the choice of guns and nozzles, pressure range and the method of application. To simplify the calculation of the amount of solution needed for coverage, we have compiled a chart which the sprayman uses in the field to gauge or calibrate his application. Basically, it divides the average acre into four categories as to height and density of vegetation. Average height is divided into four classifications from one to eight feet in height and density or coverage from open to dense. A rule of thumb is used for vegetation exceeding eight feet in height. Before starting the application over a given area or acre, the sprayman makes a hasty estimate of the average height and density of the vegetation in the given area, refers to the chart and then initiates the application. Although not totally accurate, this table is a handy tool and serves as a calibration check. Total foliage coverage and penetration is acheived through selection of the proper spray gun and nozzle. Generally, the initial application is made by handgun. When distance or heavy penetration is not required, our standard lawn spray gun with Vee-Jet, flat fan type nozzles ranging from an orifice size of 15 to 40 are used; when penetration, distance and high pressure performance are required, a gun with instant trigger shutoff and adjustable spray focus is used. On supplemental applications or retreatments, adequate coverage can often be achieved by usage of off-center nozzles. Applications of this type can be calibrated very accurately and usually result in a savings of application time. They have the disadvantage of increasing drift, showing skips when a ditch widens or over spraying when the ditch narrows and are ineffective on brush. When this method of application is used, the single or multiple off-center tips are mounted on a movable gun and are hand operated and manipulated by the applicator. Unlike applications made within industrial areas, access and operation of equipment along drainage areas becomes more critical. On roadside applications, sprayers with capacities in excess of 25 gpm, self contained engines and tank capacities of 1,000 gal. are used. Four-wheel drive units with 200 gal tanks are used in rough, field type areas. It is in these areas that crew efficiency becomes more critical than highly specialized equipment.

To emphasize and indicate the importance of the application, let me make one last point. Initially, our weed control promotional and sales efforts were directed to the consumer from the herbicide aspect. More recently, we have turned our efforts to the technical aspect of the application, and ultimately, the savings.