organization's insurability while judgments which exceed insured limits deplete a budget. Eventually, wide-spread or frequent damage can lead to restrictive legislation. Laws which prescribe application conditions and responsibility for herbicide operations do not guarantee that damage will be avoided.

SUMMARY

Herbicides are valuable tools in our contemporary economy. Unless used properly, these chemicals can damage agricultural crops by affecting yield and quality or by depositing an illegal residue on the marketable product. The ornamental, home garden and nursery plants of urban areas also may be injured by herbicides. Accurate assessment of damage and its cause is not simple. Use hazards in aquatic weed control operations can be minimized by adequate training and supervision of personnel, appropriate application equipment, judicious chemical selection and prudent operational procedures. Repeated misuse of herbicides deteriorates an organization's public relations, insurability and budget. Restrictive legislation stemming from frequent or widespread damage may not be an infallible preventive of future damage.

Aerial Application of Herbicides

As Used by the Game and Fresh Water Fish Commission

by

JOHN W. WOODS

ABSTRACT

Florida's State Hyacinth Control Program started April 3, 1952. One of the first policies developed was the use of aerial applications of 2,4-D in areas where more than 15 acres of hyacinths were rafted. This policy could only be applied when hyacinths were in open areas and not near crops. Property releases were required when spraying in areas of crops and shrubs. Specialized aircraft and precautions are necessary for successful operations. The first aircraft used was a PA-18 Piper carrying a forty gallon tank. Other types of light aircraft were used for the next ten years until the present aircraft is a PA-25 Pawnee especially designed for maximum safety and economy in spraying. This aircraft can be fitted with a hopper for granular applications.

INTRODUCTION

Florida's State Hyacinth Control Program began April 3, 1952. When the Noxious Vegetation Control Project (F-2-1-2) was approved by the Game and Fish Commission this program was described in detail (Luethy 1955, Woods & Tabita, 1962). One of the first policies developed under this program was the use of aerial applications of 2,4-D when hyacinths were found in open areas fifteen acres or larger. When surveys indicated crops or shrubs were present near areas to be sprayed property releases were required. The first aircraft used by the Game and Fresh Water Fish Commission was a PA-18 Piper with a 40-gallon removable chemical tank. This plane with its 125 horsepower engine could cover 15 acres per forty gallon load.

The Commission has since used a PA-18A Super Cub with quick detachable Sorensen belly tank, a Cessna 180 and now operates the PA-25 Pawnee especially designed for spraying operations. Our Pawnee spray plane carries a 100-gallon pay load. This load is composed of 80 gallons diesel fuel and 20 gallons of 3.34 Ester of 2,4-D.

We have continued to use 2,4-D Ester in spite of its dangers for two reasons; (1) it gives excellent swath, and (2) the emulsifiers or other ingredients in 2,4-D amines destroy fabric. We have recently covered our plane with fiberglass and may be able to use Amine. The pay load covers approximately 20 acres of hyacinths when spraying is done at 75 m.p.h. from 6 to 7 feet above the vegetatioi. The pressure is adjusted to about 20 pounds pressure. This provides for a forty foot swath; 5 gallons total material and 3 pounds active ingredient per acre. The Pawnee can be quickly equipped with a hopper which will carry up to 600 pounds of granular material for dry applications. These rates of application can be varied from 100-350 pounds per acre when applied at treetop level. Applications made from this level provides about a 70 foot swath.

CONCLUSIONS

The PA-25 Piper Pawnee is a most feasible aircraft for our hyacinth control operations. It may be used for both dry and wet applications. Certain rules have been formulated and *must* be followed when using aerial applications of 2,4-D. They are as follows:

1. Preliminary survey necessary to locate crops or shrubs that could possibly be damaged in spraying operations.
2. Secure a release from property owners when crops or shrubs are found.
3. Use an aircraft capable of flying low at slow speeds.
4. Use a pilot informed of the possible dangers of drift and experienced in aerial applications.
5. Spray only when wind is 6 m.p.h. or less.

It should be particularly noted here the success of aerial application of 2,4-D in Florida by the Hyacinth Control Division of the Game and Fresh Water Fish Commission is due largely to the dedication of our veteran pilot, Mr. Phil Phillips. This writer must acknowledge appreciation of Mr. Vernon Myers presently in charge of hyacinth operations in supplying much of the data for this paper.

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