

# AERIAL APPLICATION

## Techniques, Systems, and Precautions

The following is an excerpt from "Right-of-Way Pest Control: A Training Program for Certification of Right-of-Way Pest Control." Authors for the manual are Virginia Polytechnic Institute scientists; W. E. CHAPPELL, J. S. COARTNEY, and J. A. WEIDHAAS.\*

AERIAL application of herbicides to utility rights-of-way is a fast, efficient, economical method of controlling the growth of undesirable woody vegetation.

Since most rights-of-way are restricted in width, and may run through a variety of terrain, it is imperative that the proper equipment and techniques be utilized. Most of the advancement in chemicals and applicator systems has involved the use of a helicopter as the aerial applying vehicle.

Because of its slow flying characteristics and maneuverability, the helicopter readily lends itself to this job. It is capable of flying at or below treetop level, therefore limiting the distance the chemical must fall before reaching the right of way, thereby reducing the possibility of wind drift. The pilot is afforded excellent vision from the helicopter, which further assists in controlling the application.

### Aerial Applying Systems

There are several applying

\* Chappell is Professor, Plant Pathology; Coartney is Associate Professor, Plant Pathology; and Weidhaas is Professor, Entomology.

systems available for right-of-way spraying. Some are designed to handle a thickened material to reduce possible wind drift and resultant off right-of-way damage. But more recent equipment is designed to control drift by delivering uniform large droplets.

1. Amchem Microfoil Boom. A method of applying non-thickened material, and still maintaining control of the chemical. The system consists of a boom with many small nozzles. Low pressure carries the material to the nozzles. The nozzles are trimmed into the airflow and the chemical is laid into the airstream and falls similar to a sheet of rain.

2. Amchem 060. This is a recent adaptation of the microfoil boom. Its name is derived from the orifice size of .060 inches. The large uniform size droplets formed with this nozzle penetrate the leaves of foliage and kills small brush at the ground level. Another advantage of the 060 boom is that more precise control is maintained on the swath which enables the pilot to adequately cover brush growing in ravines under a power line and has proven adequate in drops of 200 ft. or more. The

design of the 060 boom practically eliminates fine droplets in the spray pattern when used correctly.

3. Dow R-511. A system utilizing hydraulic or electrical pumps to move the mixture of chemical and Norbak (A particulating agent used to thicken the chemical) into a series of large nozzles. The combination of large orifices, low pressure and thickening agent allow proper control of the material.

4. Conventional Boom. A system utilizing pressure to force chemical through a number of nozzles. The chemical falls to the right-of-way as a mist of various size droplets. The lack of drift control greatly limits the use of a conventional boom.

5. Amchem Spray Disk. This unit is used for the application of Amchem's Envert Emulsion. Properly mixed, the envert material reaches a consistency approximately that of heavily whipped cream. The material is pumped into the tanks of the helicopter and gravity fed to a rotating disk with nozzles. The material is dispensed in large heavy droplets allowing control and placement of the material on the right-of-way.

### Aerial Application Techniques

Flying techniques will vary according to the pilot, his experience and capabilities. However, there are several methods or techniques, that if followed, will eliminate off right-

of-way damage and reduce the number of complaints and damage claims. The following items are considered essential for safe and effective aerial spraying:

**1. Reconnaissance of right-of-way** — A proper aerial reconnaissance of the right-of-way before spraying will give the pilot advance knowledge of the presence of homes, gardens, valuable crops, trees, or other areas that should not be sprayed. Known restrictions should be marked on right-of-way maps.

**2. Observation of wind and other climatological factors, wind speed and direction** — Since wind drift of chemical is the major cause of off right-of-way damage, it is very important that the wind speed and direction be known at all times. Wind limits should be set for the chemical being used, application equipment, height of drop, and proximity and species of crops or plants next to right-of-way.

Herbicidal foliage sprays to woody vegetation by aircraft on rights-of-way when the wind velocity exceeds five miles per hour at eye level should be curtailed. In case of deep valleys requiring the chemical to be dropped long distances, it may be necessary to wait for periods when the wind is almost calm. There is also a temperature gradient between hills and valleys which may cause some air movement.

Normally the wind is of lower velocity early in the morning (dawn) and early evening, therefore, most of the production is accomplished during these periods.

**3. Continuous observation** — The pilot should be constantly observing the spray pattern to see that it does not exceed the edge of the right-of-way and turn on and turn off points are well within limits of the situation. He should be searching for any signs of the presence of valuable property or crops that may have escaped his vision on the advance reconnaissance and be ready to halt spraying at any point.

**4. Sensitive crops and other areas** — Certain crops such as tobacco, grapes, vegetable gardens should not have the spray applied closer than 100 ft. even under ideal conditions. Never spray toward sensitive crops. These areas should be picked up in reconnaissance or be

marked on a map prior to actual spraying.

Homes, parks, recreation areas and the like should be given several hundred feet clearance unless specific instructions to the contrary are given.

Avoid lakes, streams, ponds and other water sites when applying most brush control chemicals. Drainage areas that go into irrigation water should be avoided by at least 500 ft.

#### Precautions in Aerial Spraying

Regardless of the amount of judgment and caution applied in aerial application, occasional damage claims or complaints may result, legitimate or otherwise.

There is no substitute for quick, personal response to these complaints. A rapid investigation of damage complaints can save many dollars in unwarranted claims, and can create good public relations for the rapid settlement of justifiable complaints.

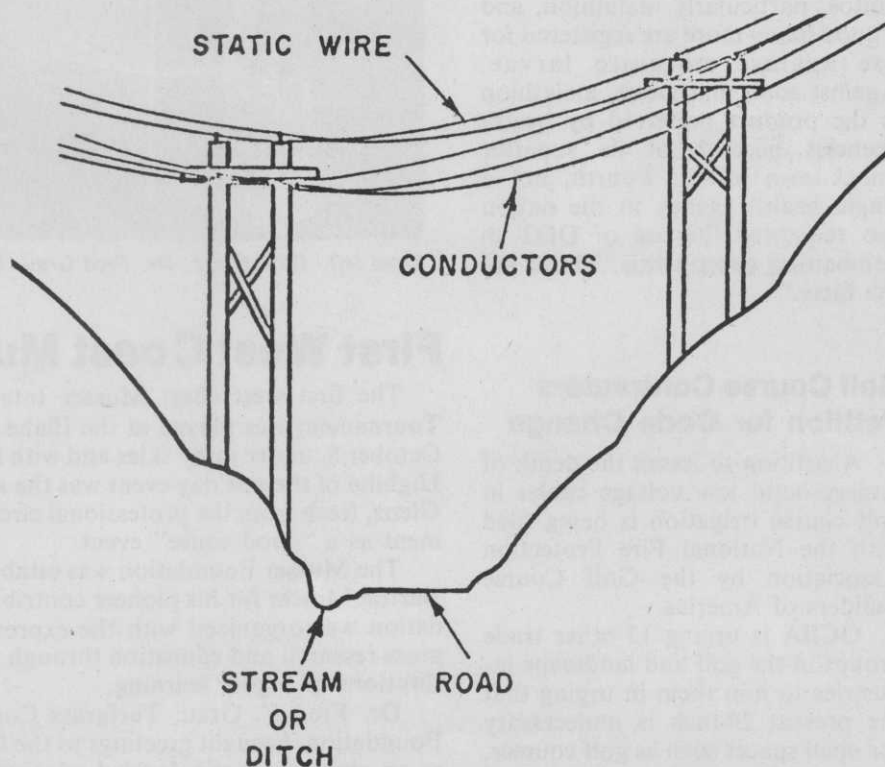
The individual who suffers actual damage deserves fair treatment for his loss. The individual who believes he has been damaged deserves the consideration of a

quick response to his complaint and an explanation of the facts.

Even though chemicals and application systems have been continuously improved to make aerial brush control of rights-of-way a practical method of control, with reduced possibility of off right-of-way damage due to wind drift, the equipment is only as good as the pilot that uses it. The pilot is the key to successful application. He must maintain the proper attitude towards aerial applications. He must be constantly aware of the serious problems that could result from improper techniques employed. He must be constantly alert for changes in weather or equipment that could affect the safe application of chemical to the right-of-way limits. Most of all, he must have a sincere desire to do the best possible job.

Due to inaccessible terrain and other factors, aerial application may often be a more practical method of controlling vegetation. However, aerial treatment has no place in urban and suburban areas, and it is very difficult to do aerial appli-

*(continued on page 34)*



*This is a profile of aerial application on a rights-of-way above 40 feet.*

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cations with 2,4,5-T and adhere to the restrictions of the USDA and VDA, EPA, and OSHA as to application near ditch banks, lakes and streams and close to buildings.

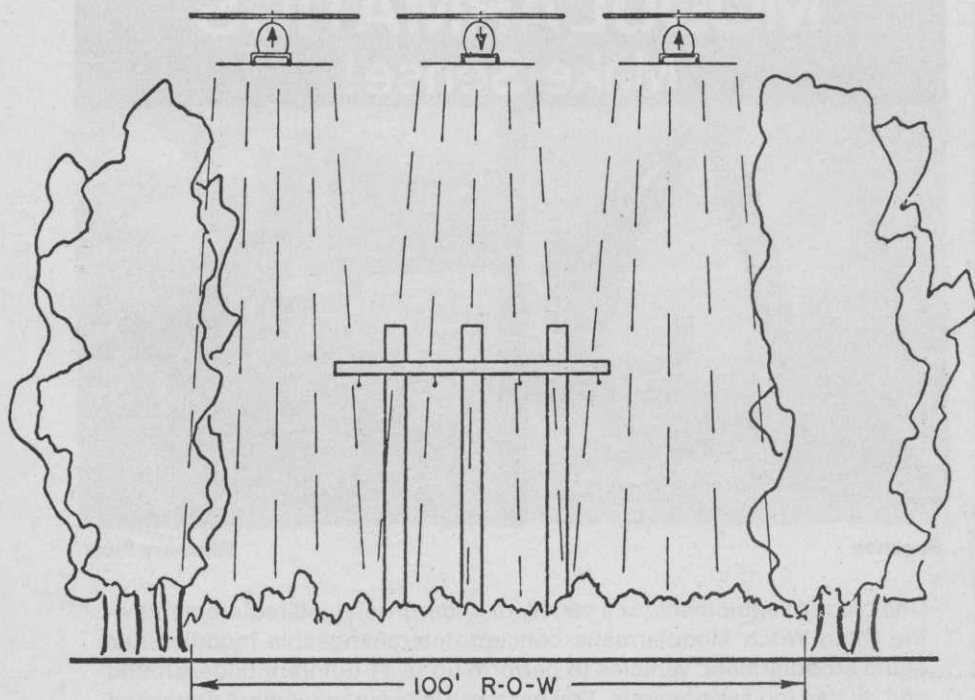
Because of the need for good public relations and the fact that the foliage of brush turns brown after spray treatment, it is advisable that no brush **over four feet in height** should be treated with foliage spray. The preferred treatment of brush and shrubby growth **over four feet should be cut first**, then given basal spray control, thus avoiding unsightly brown foliage and public criticisms.

## Calibration of Aerial Sprayers

Calibration of helicopter sprayers — Actual output per acre of aerial spray rigs is of utmost importance as with any method of pesticide application. The delivery at ground level of a predetermined amount of liquid per acre is not easy to accomplish, especially in uneven terrain where utility lines are at various heights from the ground.

Each type of aerial spraying equipment performs differently and the pilot should be thoroughly checked out with each type as he would be with different types of aircraft. For instance the width

*(continued on page 36)*



*This is a typical profile of a cross country line 44 KV or higher.*

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## International Harvester Continues Merging Efforts

Pay Line Division of International Harvester has entered Phase II of its program to merge all divisional marketing efforts into one integral organization with consolidation of construction and industrial equipment sales forces.

The consolidation, to be implemented between now and the start of the 1976 fiscal year on November 1, completes the merger which was begun last year, explained J. L. Adams, Division marketing vice president.

"At that time we combined all the marketing departments, except sales," he said. "We did this deliberately because we did not want to disrupt the on-going relationship between our sales people and the distributor organization during the merger and centralization at Schaumburg of all other marketing functions.

"We were cognizant of the fact that this step — Phase II — would have to be taken as soon as we, and our distributors, were ready to assimilate it. That time is now."

Under Phase II the country has been divided into eight regions, with a Pay Line sales force in each responsible for the sale of the entire line of International industrial and construction equipment.

"We will have a mutuality of territory with no duplication of efforts for both product support and sales," Adams said. "The boundaries of the new sales territories are almost identical to those of our Product Support regions and this will result in all-around better sales and service for our distributors and their customers."

Under the new concept J. P. (Jim) Brady, former Industrial Equipment sales manager, and T. C. (Tom) McGonigle, former Construction Equipment sales manager, become managers of equipment sales for the entire line. Brady and his organization will be responsible for the northern tier of states and McGonigle and his group will cover the southern and far western states.

K. R. (Ken Foster, formerly manager, General Product Sales, becomes assistant to the vice president, marketing.

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covered by the Microfoil boom will be approximately double the length of the boom at 50' height using .028" orifices whereas the 060 boom will cover a width approximately double its length at a height of 125'. As with calibrating other types of spray equipment the following are of importance:

### 1. Air speed

2. Pressure
3. Swath width
4. Volume

In addition for aircraft calibration the height from the ground is very important since the effective swath is largely governed by this factor. Charts are provided for proper speeds and height to cover given heights in aircraft manuals and by the spray equipment manufacturer.

In actual calibration the pilot

should first be sure that the air speed indicator is correct. This can be checked by flying over an automobile at low speeds (15-20-25-30 mph etc.). Since aircraft air speed indicators are not very accurate on the low end of the speed range. Once the aircraft speed is known the volume of spray delivered per minute should be determined in actual flight.

**With a 50' swath, 1 mi = 6 acres and 100' = 12 acres (approx.)**

If 10 gal./acre is desired it would be necessary to deliver 10 gal/min at 60 mph, using a 26' boom at 50' height with the Microfoil boom. If the height must be increased and the swath width increases then the aircraft must be slowed down or the pressure increased in order to apply the correct amount of spray. Raising the pressure is not advocated since this will often produce fine droplets that drift easily. In checking swath width it should be measured in the right-of-way since the swath tends to become slightly narrow in areas where trees bound each side of the right-of-way as compared to an open area.

Other factors that influence the application rate are "crabbing" or flying slightly sideways to compensate for air movement will narrow the swath width and cause "streaking" in wide rights-of-way. In general a pilot learns many of the fine points of spraying with experience and cannot become proficient until he has mastered the many different situations involved in aerial spraying.

Spraying with a helicopter is not only useful in controlling weeds and brush underneath the conductors but side trimming of adjacent trees is also accomplished in the same operation. This greatly reduces future trimming costs and aids in preventing electrical outages during wind and ice storms. In spraying operations one pass is generally made to a given area regardless of the equipment being used on the helicopter. Better results can usually be obtained by flying in both directions, especially with the Microfoil boom, but this increases costs per acre. With equipment that deliver higher gallonage with larger droplets such as the Spray Disk as the 060 one pass is sufficient. □

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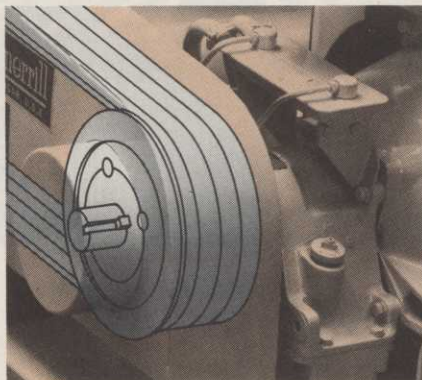


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