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In this article, veteran weed controller J. C. Redd, of Jackson, Miss., shares his background with the novice contract applicator.

other pests in season, can be conducted with the same personnel and equipment presently used for general pest control.

In most cases, the homeowner himself can't take care of these lawn pests. He seeks an organization which can successfully and economically get rid of the invaders in his lawn, whether they're insects, weeds, or diseases.

The luxurious growth of most shrubs and ornamentals, and the treatment of lawn pests, usually require sprayers and applicators with high volume and pressure. Homeowners can no longer get control with hand or knapsack sprayers.

Moreover, contract applicators generally offer control of lawn insects and weeds, such as crabgrass, for less than the customer would spend to do it himself. And the chances of failure are greatly reduced when a professional does the job.

Profits in Weed Control

Chemical weed control is another service which is making money for a lot of operators. There are opportunities to control weeds around buildings, parking lots, drive-in theatres, junk yards, fence rows, walkways, lumber yards, and other such sites. After the applicator gains basic knowledge, he may want to go after the big jobs too, such as oil wells, refineries, tank batteries, flow lines, and large industrial plants. Eventually, the ambitious weed controller will tackle railway rights-of-way, utility lines, and turnpikes.

Obviously, there are different

degrees of weed control, ranging from the small job trimming borders of walks with chemical and sprinkler can, to large contracts where an entire soil area is to be sterilized. Cost to the consumer may range from \$5 to \$10,000.

Some typical charges for weed and turf pest control are shown in Figure 1.

Equipment can be as simple as the sprinkler can, or as expensive as high capacity hydraulic sprayers and blowers. "Trial and error" experience from small jobs will help the applicator get ready for the big ones.

PCOs have noticed many of their regular household pest control customers are beginning to see how important it is to also include

accounts for the same unit of time because there is not yet enough volume in vegetation control to benefit from lower costs.

Managers often use costs of labor and materials to decide if a job is profitable. Labor and goods should not exceed 40% of the price charged. For example, if labor costs 30%, then materials should not run over 10%. Or, if materials came to 16%, then labor should not be more than 24% of the price charged.

Let's compare the income and profit of a 2-man crew working on a weed job with one working for the same length of time on a termite job. On a weed job, a 2-man crew working one day should bring in a minimum of \$500. After the

Figure 1. Sample Charges for Outdoor Services

Turf Pest Control		
Season Control		After July 31
1,000 to 10,000 sq. ft.	\$7.00 per 1,000 sq. ft.	\$4.00 per 1,000 sq. ft.
10,000 to 50,000 sq. ft.	\$5.00 per 1,000 sq. ft.	\$3.00 per 1,000 sq. ft.
Weed Control		
500 to 1,000 sq. ft.	2 to 3¢ per square ft.	
5,000 to 10,000 sq. ft.	0.8 to 1.5¢ per square ft.	
Industrial Sites of acre or more:	1st year —	0.8 to 1.5¢
	2nd year —	0.6 to 1.0¢
	3rd year —	and up —
		0.5 to 0.8¢

turf insect and disease control. This is especially true in the South. It is predicted that in the future few jobs will be taken without including turf pest control with the home contract.

Monthly weed control is different. For it to reach the same degree of permanency, customers have to be convinced:

- (1) that the work can be done satisfactorily,
- (2) that the fee is reasonable and economical, and
- (3) that the work must be done on a regular, sustaining basis to achieve desired results.

Pricing Method

Structural pest control operators considering weed control will have to look at pricing practices. To arrive at a true and just comparison, compare these two types of services on a material and labor basis, using the same time unit.

Normally, more income per job is expected from weed and turf

initial treatment, follow-up service usually requires at least 3 visits which, altogether, should take about as much time and material as the original application. Thus such a job would require 2 crew days at \$32 per day, or \$64 for the job. Normally, materials cost between 15 and 20% of the total price, or about \$100 in this case. Labor and materials for this kind

(Continued on page W-18)

WEEDS and TURF
PEST CONTROL

A SECTION OF PEST CONTROL MAGAZINE

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A NEW CHEMICAL weapon has been added to the commercial applicator's arsenal of materials to control vegetation on industrial sites. Called Hyvar weed killer, it is a soil sterilant developed by Du Pont. It represents a new class of highly active organic herbicides for vegetation control, and is particularly useful for long-term general weed control on industrial areas where grasses are the main problem. Field studies have shown it to be in the range of 2 to 5 times more active against hard-to-kill grasses such as Johnson, Bermuda, nut, and quack grasses, than soil sterilants presently in use. Furthermore, it performs consistently on a broad range of soil types, because it is less subject to adsorption on soil colloids than many herbicides. Although it is not in full production, supplies are available for commercial trials this year.

Like Du Pont's Telvar monuron weed killer and Karmex diuron weed killer, Hyvar is formulated as a wettable powder. It can be mixed with water or herbicidal oil and applied with any equipment suitable for soil application of a wettable powder spray mixture. Generally a fixed-boom power sprayer is recommended, because with proper calibration it will give a constant rate of application. However, it can be applied with

Hyvar: New Weed Killer Designed For Industrial Sites

By L. A. CONN

Industrial and Biochemicals Department
E. I. duPont de Nemours and Co., Wilmington, Del.

hand-operated guns on hose lines, or (for small areas) with a knapsack sprayer or sprinkling can.

The vegetation problems for which Hyvar weed killer is recommended, and the rates, are:

Annual Weeds and Grasses

4 to 8 pounds per acre — For such species as foxtail, crabgrass, cheatgrass, wild oats, brome grass, ryegrass, pigweed, ragweed, purslane, wild mustard, cocklebur, and lambsquarters.

Perennial Grasses

5 to 15 pounds per acre — For such species as quackgrass, bluegrass, smooth brome, and brome-sedge.

15 to 25 pounds per acre — For hard-to-kill species such as Johnson grass, Bermuda grass, and nutgrass.

Perennial Broadleaf Weeds

10 to 15 pounds per acre — For such species as dock, wild carrot, sheep sorrel, plantain, and dandelion.

15 to 25 pounds per acre — For hard-to-kill species such as bounce-

ing bet, spurge, dogbane, goldenrod, daisies, and asters.

(The higher levels of ranges given above should be used on very adsorptive soils — usually those high in organic matter or carbon.)

The new family of chemicals from which Hyvar was developed is designated as substituted uracils. Hyvar is based on 5-bromo-3-isopropyl-6-methyl uracil. This family of compounds promises to provide interesting candidates for a variety of herbicidal applications. Several other substituted uracil compounds are in various stages of testing by Du Pont.

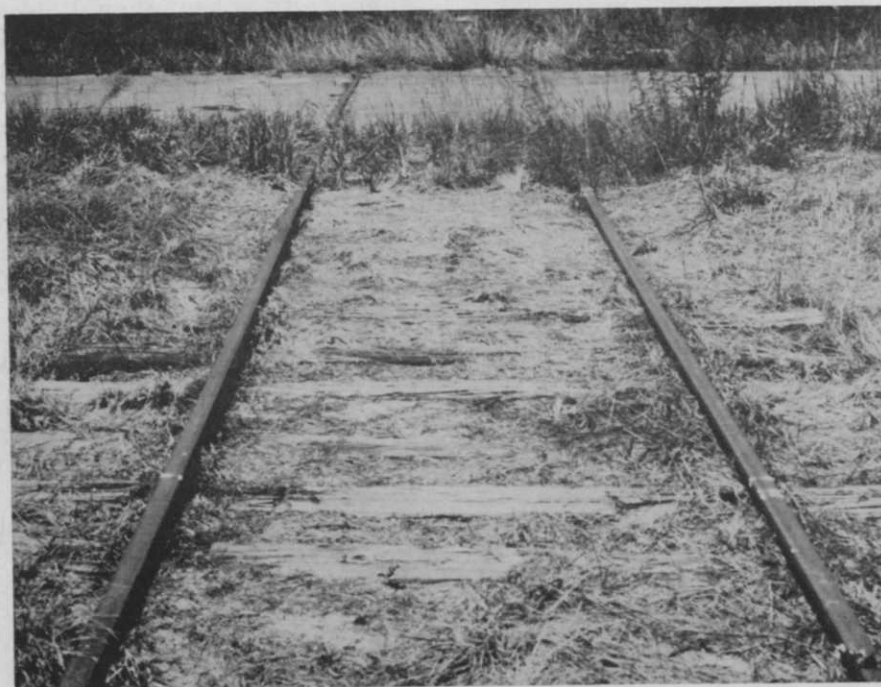
Hyvar is nonvolatile, nonflammable, and low in toxicity to people and animals under recommended conditions for use.

Wettable powder herbicides, such as Hyvar, can be used in most hydraulic sprayers provided all screens and strainers are at least 50-mesh, but continuous agitation is required to keep them from settling out. Mechanical agitation is preferred, but a "jet agitator" in the bottom of the tank can provide very satisfactory hydraulic agitation. The bypass line should always come close to the bottom of the tank to reduce foaming.

A jet agitator is easy to install. A pipe is attached to the output side of the pump and extended into the tank and along the bottom. Jet agitator nozzles are spaced along the pipe to maintain turbulent agitation. Even a small pipe with holes drilled in it can be used to create a constant turbulence. To maintain adequate agitation, the spray mixture should be recirculated through the pipe at about 10% of the total tank capacity per minute.

If a knapsack sprayer or sprinkling can is used, the mixture should be shaken or stirred at frequent intervals to maintain the chemical suspension.

Applicators using wettable powder herbicides for the first time



Hyvar weed killer was applied to this spur track, foreground, in the high rainfall area of Florida, using 18 pounds per acre. The photograph, taken 5 months after application, shows the effectiveness of Hyvar on the undesirable growth.

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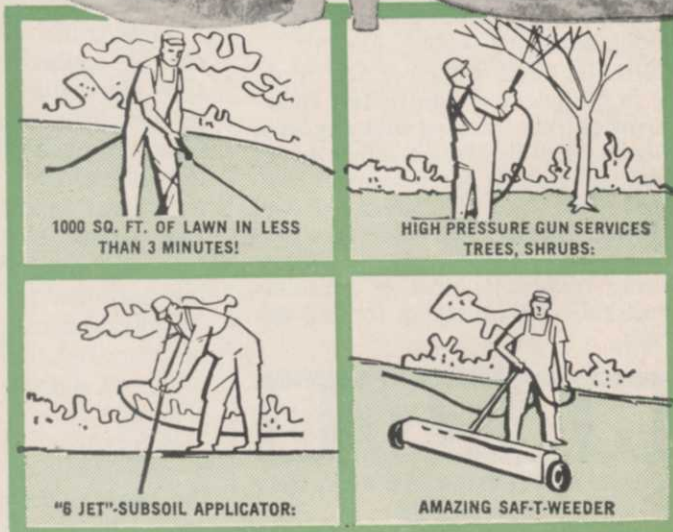
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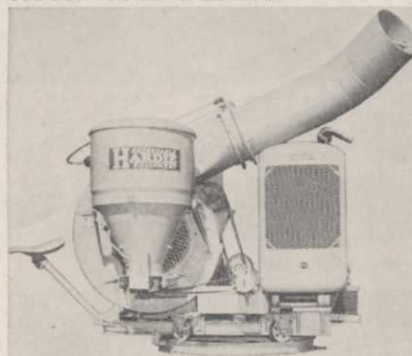
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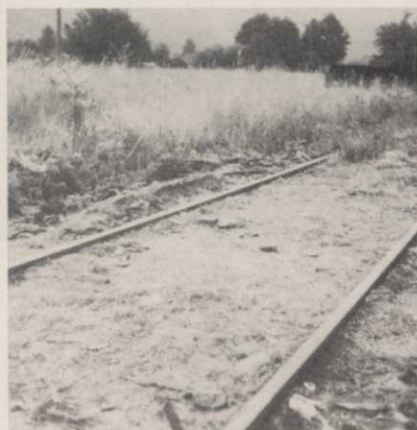
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should use a water volume of 200 to 300 gallons per acre to carry the recommended amount of chemical, especially where hand-operated weed spray guns on hose lines are used. With experience, it will be found that certain jobs require less spray per acre, often as little as 100 gallons per acre and sometimes even less. Smaller volume means smaller nozzles, lower pressures, but of course more accurate calibration and greater care in spraying.

When the equipment is adequate, the proper rate per acre should be determined, and the sprayer should be calibrated to deliver this rate in the spray-



On this track in the state of Washington, Hyvar weed killer was applied at 15 pounds per acre. The photograph was taken 4 months later.

water ratio which is being used. Hyvar weed killer is applied at rates of 4 to 25 pounds per acre, and at least 2 gallons of water are required for each pound of Hyvar. The proper amount of Hyvar for each tank filling should be weighed out carefully.

Apply Early in Growth Season

Field trials indicate that Hyvar can be applied effectively at any time during the period of active growth for the weeds to be eliminated, but kill will be most prompt if application is made during the early part of the growing season. Late season applications are not recommended, when plant growth has hardened off or is dormant.

Tall and dense vegetation should be removed before spraying in order to obtain uniform ground coverage.

Before using Hyvar weed killer, or any other herbicidal chemical, the area and type of vegetation should be examined to determine

whether one chemical should be used alone, or whether conditions indicate a combination of chemicals.

For example, where hard-to-kill grasses grow in combination with woody vines and brambles, other herbicides of known effectiveness for control of woody plants will need to be included in the spray. With many commonly found mixtures of grasses and broadleaved weeds, 50-50 combinations of Hyvar and Karmex diuron weed killer have proved effective.

Furthermore, topography, soil texture, and rainfall enter into the weed control picture. If water moves laterally in the treated area, plants immediately outside the treated area may be affected. Also, trees with only a small part of their root system in soil containing a soil sterilant may be injured or killed.

None of these soil sterilant materials should be used on lawns, walks, driveways, tennis courts, or similar areas. Equipment used for them should not be used for applying any chemicals to desirable vegetation; and care should be used in draining or flushing equipment, to be sure that no tank residues reach the roots of desirable plants, and that no chemicals get into any water supplies.

The areas where Hyvar weed killer and other soil sterilants are suitable include:

Oil industry — refineries, pipelines, tank farms, producing wells. *Railroads* — track, yards, sidings, crossings, bridges, switches, towers. *Industrial plant sites* — parking areas, storage areas, fence lines, sidings. *Roadways* — shoulders, guard rails, bridge abutments, curbs, signposts. *Drainage ditches* — dry ditch bottoms.

Custom applicators have long served some of these markets with pest control programs, disinfectants, or equipment cleaning and maintenance. Vegetation control is a growing segment of the business. Each new chemical herbicide development, such as Hyvar, adds to the specialized service which the custom applicator can provide.

Next month:

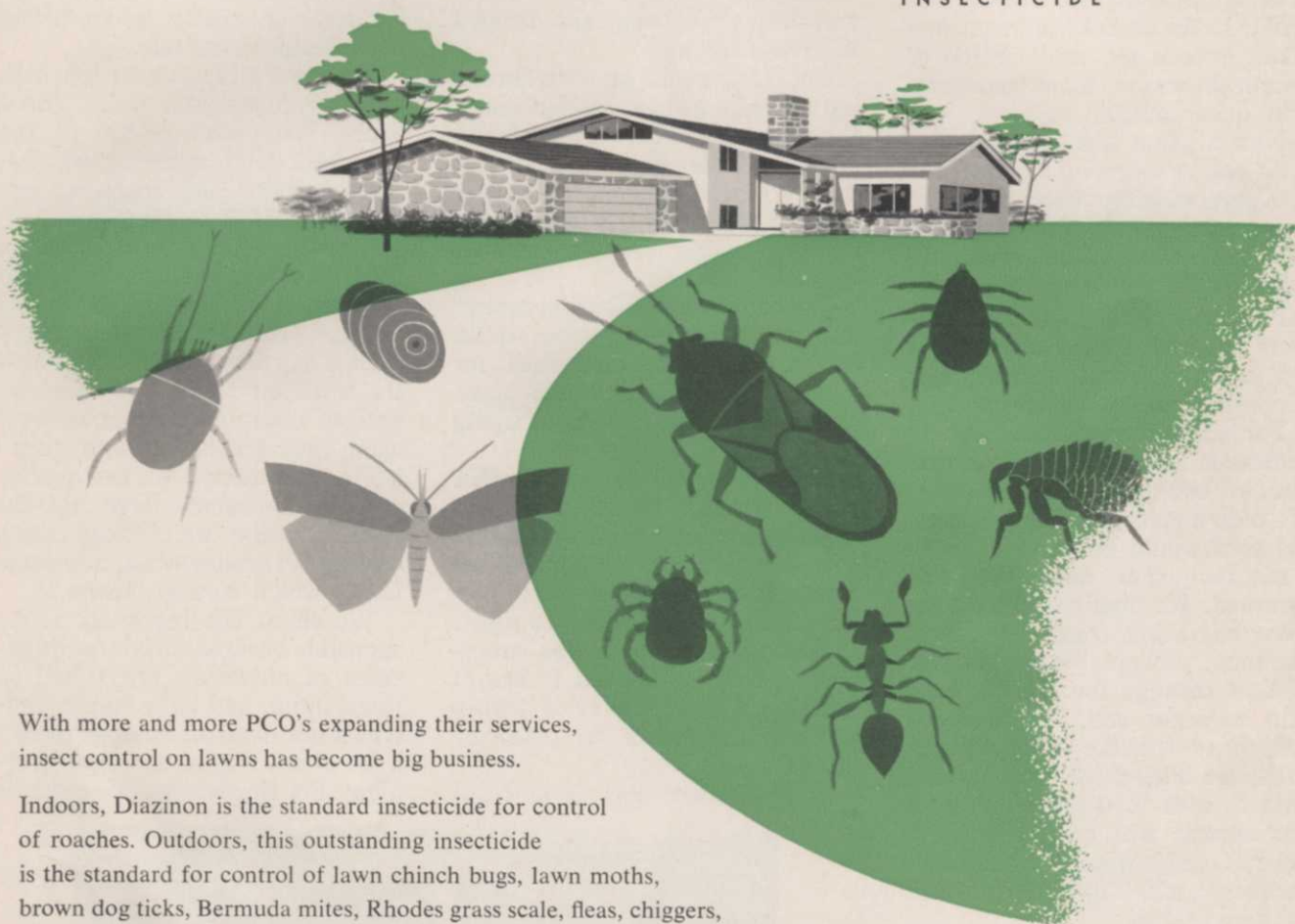
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Self-Designed Power Spray Rig Was Shortcut to Home Lawn Market

By ROBERT H. J. PELLETIER

Ideal Spray Company, Lynnfield, Massachusetts

WHY DID we consider going in to lawn spraying? When our company was a fledgling years ago, we knew lawn service had offered little opportunity for substantial profits in the past. Equipment was often expensive, and choice of chemicals was as scant as results were questionable.

Now all that has changed.

As the years rolled by, and our firm grew with the times, we began to come across certain perplexing customer complaints which recurred with increasing frequency.

Primarily these unhappy customers were concerned about their lawns, and the insects and weeds which had all but taken over.

For example, residential ant infestations seemed to grow worse, and we couldn't figure out why. We'd do a good job inside, and all the ants would be gone. Then in a relatively short while, the pests returned. We finally decided they were migrating from the lawns, attracted perhaps by the transfer of heat through foundation walls into adjacent soil. We believed this heat transfer kept nearby colonies sufficiently active to force ants to seek food inside. Part of our answer was to put down a layer of dust around the building's perimeter, which did help prevent ant migrations.

Right after the war we got a call to control an earwig infestation in Nahant, Mass. It was 1946, and we hadn't any idea how to control earwigs other than to spray with available chemicals. Back then we were already using a lot of chlordane for roaches and ants so we tried it on the earwigs and got 100% control. It seemed easy.

Next year, the same calls came again. By this time the chlordane flyers were beginning to talk about servicing estates and lawns for ants, earwigs, chiggers, webworms, lawn moths, chinch bugs, grubs,

etc. We had 2 or 3 calls on earwigs that year, so we consulted with some authorities to see what the story was.

We learned lawn pest control was the coming thing, and decided to give it a try.

For a few years we tried throwing chlordane dust out by hand; then we tried spraying with hand sprayers. Later on, we decided to build a pump for spraying because there weren't enough calls back then to merit the purchase of special equipment.

We bought a well-known motor, and put a pump together. After half a season, it broke down for good. We didn't know too much about the mechanics of pumping systems then.

Next year, we bought another pump (different brand) and spent two seasons hauling it on and off a trailer from job to job. If the pump broke down, it took from 30 minutes to half a day to repair it. But the experience was educational, and we decided it wasn't worthwhile to carry a pump around from place to place by hand.

So we retired the rig and put

together our first practical unit. For power, we used a Briggs and Stratton motor. We got a diaphragm pump (the Ace type) with what is called a top hat or an air chamber to prevent pulsing. We added bypass and selector valves, strainers, pipes, etc., and 200 ft. of special insecticide hose and were ready to go.

This unit was permanently attached to our trailer and connected with pipes to two 55-gallon drums with bypass returns. These returns fed into the drum in use, and thus acted as an agitator. This agitating system has worked well for us, especially when using emulsifiable chemicals.

We went from job to job with our Ace pump and trailer for 4 years. We didn't realize at the time that lawn spraying was becoming more and more an important part of our business.

We often thought we'd buy a used oil truck, but we were afraid the amount of lawn spraying and termite work wouldn't support such a big investment. We ruled the truck out altogether when we noticed many oil companies were using their trucks for lawn spraying in the summer. We feel quality suffers when these large rigs are used, because we noticed some damage to ornamentals, and some lawns which turned brown.

We think the big truck is responsible because such large quantities of chemicals are mixed in these units, and agitation is difficult if not impossible. Also, there's a lot of settling of chemical overnight. For this reason, one custom-



Cost of the war surplus fuel selector valve PCO Bon Pelletier is pointing at was only \$3.95. Pressure valve and hose connections are easily accessible.

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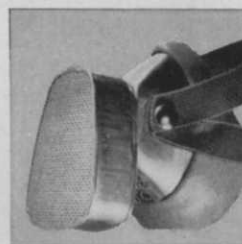
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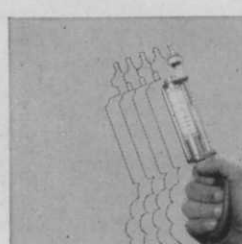
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W-9

er is apt to get a high percentage of chemical, while another down the street gets mostly water.

Perhaps some of the new, specially designed outfits have overcome this problem.

Our own answer, when we needed more equipment, was a 1960 pickup Jeep with 4-wheel drive. To add a power take-off, we hooked up the transmission so it runs a Hypro 6-neoprene-roller pump. This is located underneath the Jeep, completely out of the way. This pump is again connected to two 55-gallon drums carried in the box of the Jeep. As can be seen in the pictures, we have bypasses, relief valves, selector valves, and hose connections all conveniently attached to the outside right hand side of our pickup.

We put away our 200 ft. of $\frac{3}{8}$ " insecticide hose and bought 300 ft. of $\frac{3}{4}$ " garden hose which is easy to handle and does not kink. It is rubber with neoprene housing and is guaranteed by the manufacturer "to withstand 15 times house pressure." We use this type of hose because it delivers a good quantity of chemical, saves time, and is light and easy to maneuver. We've now used this hose for 3 years without any unusual breaks or harmful effects from the chemicals we spray. These chemicals are the emulsifiable type, such as chlordane and dieldrin, used primarily for lawn treating and termite work.

The pump itself is almost fool-

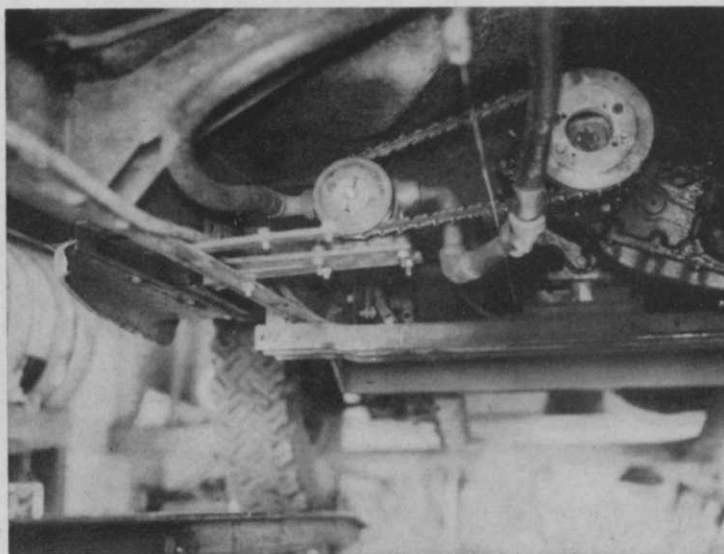
proof. We can completely overhaul it, replace the rollers with a whole new set, and be back in business in a half hour at the most.

Extra Benefits

There are also "secondary values." For example, our power take-off system is safe. Children are always around looking at our equipment, but now there's no chance they'll get their fingers caught in the mechanism. The whole unit runs directly off the Jeep and we find it 100% efficient.

For our belt drive we use link belts which are easy to adjust on the job without having to move pumps, etc., on slotted bases. There are belts on the market today which can save precious time and expense with the elimination of one link, or cutting off 1" and reconnecting the belt with special connectors. These pulley belts cost about the same as the old continuous type which have no connections, and which have a bad habit of wearing out or expanding at the wrong time. This required using all kinds of tools to move motors and get everything going again.

We are amazed that so many contract applicators have trucks which could be converted like ours, and so few have used this device. Right at their fingertips, they have the means to add a power take-off directly to their vehicles. With the proper arrangement of pipes, hoses, adapters, etc., operators can have one of the sweetest spray rigs available.



Author Pelletier says his Jeep power take-off (upper right-hand corner) is efficient and a real timesaver. The Hypro pump is driven by a link belt. Note $\frac{3}{4}$ " feed lines on both sides of the pump.

Insects Promising for Control of Alligatorweed, USDA Says

Several South American insects may be useful for alligatorweed control, according to a report from the U. S. Department of Agriculture. Alligatorweed is a costly aquatic pest in the South.

Research has shown insects can be pitted against weeds with effective results, USDA scientists say. In the western U.S., for example, a beetle imported from France successfully controls the noxious Klamath weed, which once infested millions of acres of rangeland.

Especially promising for alligatorweed control is a flea beetle that apparently was successful in Argentina. This beetle is not known to feed on any plant other than alligatorweed and its one close relative, a plant not found in the U. S.

Two other insects: a stem borer, and a species of thrips, are the chief suppressors of alligatorweed in the extreme South, where temperatures may be too high for the flea beetle.

At least two years of work will be needed in South America, scientists from USDA's Agricultural Research Service admit, before any native weed-destroying insects can be brought into the U.S.

This additional research will include: (1) further screening to make sure flea beetles don't hurt beneficial plants or attack stored foodstuffs; (2) isolation of the beetle from two natural parasite enemies — a fungus and a small fly — so it can be sent here free of parasites; and (3) adjustment of the beetle to U.S. seasons, which are of course the opposite of those in South America.

Alligatorweed, a native plant of South America, is potentially one of the most troublesome aquatic weeds of the southern states. Resistance to certain herbicides has complicated control measures.

Roberts Bulletins Available

Several brochures on Herbisan 5, Thiram, and other weed and turf chemicals manufactured by Roberts Chemicals, Inc., are now available to weed and turfmen. For copies of them, write Roberts at Nitro, W. Va.