A built-in plus value of this gleaming spray rig is the lack of any spray drift (as shown above), author Nipp contends.

How We Built a Whole Fleet of Lawn Spray Trucks

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WE STARTED in the lawn spraying business here in the Fort Lauderdale area with a 200-gallon spray tank and an 18-GPM pump.

As our business grew, we found we were spending too much time filling the tank, and we were working the pump steadily at full capacity 8 to 10 hours per day.

At this point, we decided to get a bigger tank and pump.

All that was available for quick delivery then was a 300-gallon tank and a 20-GPM pump, so we bought them, knowing full well they were only a little better than what we were using, and far from what we really wanted. Six trucks later we realized that if we were ever to have exactly what we wanted we would have to design and build it ourselves.

Basically, this is what we had in mind: a truck that would spray all day, requiring only 2 fillings; and a truck that would enable us to spray each and every lawn that we came to with any combination of chemicals required and without delay.

In our operation, we have to be *custom* sprayers, yet do a *volume* business.

We had heard of the injection system, but this proved to be far too costly and cumbersome — not to mention troublesome from a maintenance standpoint. Finally, we came up with the idea of a "drop tank."

In our case, a 225-gallon tank is mounted at the rear and under a 1200-gallon tank, with the lower tank to be quickly filled from the upper main one. By connecting the 2 tanks with a 2″ line and a brass quick-opening quarter-turn valve, our problem was solved. With this hookup, we can fill the lower tank in one minute and 40 seconds. In addition, we installed a four-bladed agitator in the "drop" tank. This, combined with a "by-pass" line, which goes into the "drop" tank, furnishes far more agitation than we will ever need.

In the beginning we decided we wanted a pump large enough so we would never have to work it at full capacity. We also had in mind a slow-speed pump, one that would take little gas to operate.

We finally settled on a popular-make 35-GPM pump. This pump was set to turn at only 70 RPM; and in actual tests with 200 feet of ½″ hose and a gun tip 65-70 with pump pressure setting of 650 lbs. PSI, we got a pressure of 150 lbs. PSI at the gun and an output of 9 GPM from the tip. This enables us to apply 200 gallons to a lawn in a little over 20 minutes. By way of comparison, on a previous truck we had a high-speed pump with the same pressure setting, same amount of hose, and the same gun and tip. Now, with this new setup, we could also apply approximately 9 gallons per minute.

But here is the catch. On an average day this pump required 8 gallons of gas to operate. The cups on the pump had to be replaced at least every 3 months, not to mention other, more costly, repairs such as procelains, springs, etc. Over the period of a year, maintenance cost on the pump alone on the older outfit amounted

to $268.00. Maintenance of the air-cooled motor was $84.00.

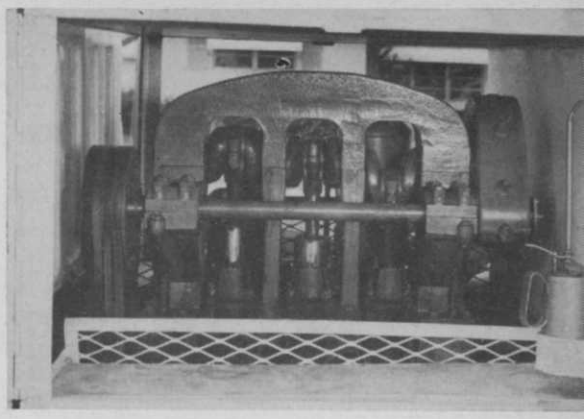
By eliminating the air-cooled motor and going to power take-off, (see W&T, July '63, p. W-8) and using a larger, slow-speed pump, our maintenance cost for the first 10 months has amounted to exactly 8 cents, which was the replacement of a cap bolt on the filter, which really has nothing to do with the pump. Bear in mind that this unit is working 6 days a week and so far as we can see is still in perfect working order.

There is one other cost factor that is most important: we find our gas consumption is approximately 4 gallons less per day doing the same amount of work. Remember, however, that this is brought about by installing a larger GPM pump in the beginning. If the pump were smaller, then the RPM would have to be faster; thus, gas consumption would naturally be higher.

We estimate our gasoline bill is reduced over $300.00 per year on each unit by the use of a larger and slower speed pump. It must also follow that a pump that is working only half of its rated capacity will last longer and require far less repair and maintenance.

There are many factors that must be considered in building a large spray truck, such as maneuverability, balance, safety, and appearance. It was easy to figure out the weight and balance factor and come up with the right size truck and the correct cab-to-axle measurement. We discovered we could not use the "cab over" type of truck, because this variety places too much of the weight on the rear axle and causes the front end to lift when loaded. Also, it is murder on rear springs, tires, universal joints, and clutch.

Care must be taken on the installation of the shafting, for the power take-off unit pillow blocks must be spaced fairly close together in order to prevent whip. Further, it is advisable to install the best that money can buy; and to avoid real trouble, these blocks must be lubricated once a week. On the average power take-off installation there will be only 7 places to grease. This operation will take a man approximately 5 minutes to do a complete lubrication. The alignment of the shaft and all shives must be perfect unless one wants to replace belts constantly. A little extra care at this point will pay off in longer belt life. Here again we use 4-B belts where, according to the experts, 3 will do. On the truck, we install 900x20 rear tires and 8.25 x20 front tires. We find these sizes give us longer tire life. Having an alternator on the truck is also a must due to the fact that the pumping is done at a speed comparable to idling speed.



Pump is mounted forward and low for easy maintenance. Fire hydrant attachment and meter are on opposite side of this same section.

Operator can add chemical to the lower tank with ease and speed, as this sprayman demonstrates.

Include Ample Baffles in Tank

Other important factors include ample baffles in the upper water tank. We divide the upper tank into 8 compartments, also utilizing the baffles to stiffen the sides, which prevents any wavy side condition. Our filling pipe is 2″, which, after entering the tank, runs up to within 2″ of the top. A 2½″ overflow pipe is then installed, which runs from below the tank up to within 2″ of the filling pipe. This supplies an "air gap" of 2″, thus preventing any syphoning action back into the fire hydrant. This syphoning action has happened; for example — a spray truck was filling at a fire hydrant when a fire truck hooked on to the same line several blocks away and actually drew from the spray tank.

Another important factor to remember is that in mounting the tank, it is a *must* to have the upper tank resting on wood. This support must be so constructed that the tank can "work." If mounted steel to steel and welded down, leaks will surely develop. In the case of some of our tanks mounted in this manner, there were splits from top to bottom.

In the beginning we worried about what coating to apply to the inside of the tank. We tried all the commercial coatings, including epoxy, and found them

Convenient storage tanks in the rear hold adequate supply of herbicides, insecticides, fertilizers, etc.

all to be unsatisfactory. In the end we found that one good coat of red lead does the job better than anything else. However, the steel must be treated first with "Metal Prep"; then once each month thereafter one quart of Toxaphene should be added to the upper tank, which keeps an oil film on the tank and prevents rusting.

The signal lights on the truck are so arranged that while the truck is pumping, the turning lights on the side and the rear can be left on and flashing.

Holds Enough Chemical for Weeks

The rear compartment can hold enough chemical to operate for several weeks if necessary. This compartment is kept locked when the operator is not present. The quick-fill valve is also located inside the locked compartment to prevent anyone from opening it and causing the "drop tank" to overflow. The "drop tank" is equipped with a locking latch so that the truck can be parked in complete safety.

We are constantly working to improve our trucks. Our next model will have a power reel, and the chemicals will be put into compartments from which they will be piped into a measuring chamber and from there into the "drop tank." Thus the operator will not handle the chemical at any time except when the chemical storage compartments are pumped full which is approximately once a week. We are certain that as time goes by we will think of many more improvements, and as we do they will be incorporated into our models. Our trucks are giving us a great savings in maintenance, and there is no waste of material since operators mix the "drop tank" for each lawn on an individual basis.

Dutch Elm Disease: Cause, Precautions

Dutch elm disease, one of several wilt diseases with similar symptoms that attack elms, has no known cure today. It is possible, however, to reduce losses by taking adequate precautions.

Usual symptoms of the disease are a wilting and yellowing or drying of foliage, usually followed immediately by defoliation and death of the affected branches. Although Dutch elm disease commonly appears on one or several branches and then spreads to other portions of the crown, the entire tree may suddenly develop disease symptoms.

A brown discoloration in the water-conduction vessels of the wood develops in all infected trees. In early spring this may be seen as brown streaks in the wood layer just under the bark of diseased branches.

Principal carriers of the Dutch elm disease fungus are two elm bark beetles: the smaller European elm bark beetle, by far the most important of the two, and the native elm bark beetle.

Habits of European Bark Beetle

European bark beetle, chief carrier of the fungus, will attack all species of elm, and plants of some closely related genera. Feeding attacks by adults are made only in living elm trees, usually in one- or two-year old twig crotches. Although adults do most feeding near their birthplace, they have been found feeding more than two miles from breeding areas.

Bark beetle feeding during the spring and early summer is most likely to result in a severe case of Dutch elm disease. Late season feeding, however, usually results in very localized infections that seldom cause serious damage to the tree.

Beetles Prefer Dying Trees

Dead or dying elm material is preferred for broods of young, although it is not uncommon for beetles to make so many attempts to breed in certain weakened but living trees that the trees eventually die and broods of the insect are successfully established.

If the fungus is established in dead or dying trees or in cut wood used by the bark beetles for breeding places, the entire generation may contact spores of the fungus on their bodies and then introduce Dutch elm disease into living trees.

Once the disease does appear in an area where the bark beetles are well established, it increases at an extremely rapid rate unless steps are taken to control it.

No cure for the Dutch elm disease is available yet. Two precautions that should be taken to curb possible loses are:

(1) Eliminate material the beetles use for breeding. Remove living elms severely weakened by drought, dead or dying elm trees, and any broken limbs or any recently cut wood. This material should be burned or the bark surfaces thoroughly wet with an insecticidal spray.

(2) Spray all living elm trees in the spring and early summer with a large gallonage of DDT or methoxychlor to prevent or reduce feeding by beetles in living elm trees.

Sanitation a Must For Plant Disease Control, Agman Notes

Contract applicators cannot keep the spread of plant diseases to a minimum unless sanitation becomes a regular practice, Dr. R. E. Partyka, plant pathologist at Ohio State University Extension Service, Wooster, points out.

Dr. Partyka recommends disinfecting tools immediately after they are used. One suggested method is to soak them for a few minutes in a crock containing 1 gallon of commercial formaldehyde in 18 gallons of water. "Methyl bromide can be used in a small, confined space," Dr. Partyka notes.

Clothing, and especially shoes, may carry an infestation from one lawn to another, he cautions CAs, and it is best to change, or take some other precaution, before moving on to another operation.

Equipment, such as sprayers, should be washed in 70% alcohol or chemically treated, whenever they are used, Dr. Partyka concludes.