

# To Design a Better Sprayer

By RAYMOND G. HILL

THE FIRST in a chain of needs became apparent in 1954, when as a "Born-into-the-industry" landscape nurseryman, I felt the hopelessness of current horticultural care. I entered a new field, new in 1954 and still new twenty-one years later. The field of selling no plants but growing them — the field of professional horticulture.

Something had to be done about well designed and costly plantings losing their character through neglect, about plantings slowly losing their value almost as soon as planted, about beautifully planned plant masses becoming ragged by disease or insects. Something had to be done to help plantings to develop as they were intended to develop.

Spraying to control specific diseases and insects was, of course, one of the things that had to be done. And fertilizing with pressure injected liquids for quick response was another. This was a very satisfying profession.

It is a very gratifying business. And one of the gratifications is the new knowledge that pressure injected liquid feeding can produce long lasting effects as well as quick response.

Trees and shrubs examined a year following liquid feeding still showed the deep color and vigor of well fed plants. Young trees made strong growth both in top and caliper; and mature trees, even aging trees, showed slow but steady response in terms of leaf size and thickness, in color, and in head density.

Once in a while a vivid piece of evidence shows itself. With our pressure injected liquid feeding we treated a weak and chlorotic section of some thirty feet in a long hedge of wax leaf ligustrum. Soon the weak section was no longer weak but had caught up in size with the remainder of the hedge. The chlorosis was gone. A year later the treated section was the best part of the hedge, and three years later was

still richer, thicker, taller and better in every way.

Our pressure liquid feeding was done heavily. From the beginning we have used water as a carrier for fertilizer — a device to put the fertilizer where we want it. It is the chemicals used that fill plant deficiencies. Dissolving the chemicals in water and pumping the solution into the root zone is a sure way of getting the chemicals into place so they can feed the treated plant. The amount of fertilizer used is about the same used in applying it dry. The amount of water used is sufficient to dilute it to a safe application point and to carry the dissolved elements into saturation of a substantial part of the soil mass. Even phosphorous applied in this ideal way is hugely effective. Effectiveness is partially due to placement and dispersion, and partially due to a favorable pH adjustment, possible only in liquid application.

Diagnosing plant ills, treating and achieving success is a fascinating new field. But there are problems too. It becomes very difficult to treat plants as individuals, as we

know them to be, when you have one mixing tank and many separate ills to treat. It is frustrating to need many formula variations when it is impractical to change. It is costly to find a need for acidifying chemicals in treating the universal alkaline chlorosis of the Southwest. It is costly because these chemicals are corrosive to metal tanks and metal pumps. Alkaline soils like acid but metal does not! Agricultural or farm fertilizers used for economy and used in our massive amounts for effectiveness are corrosive too. Ordinary pumps were found to be short lived and ordinary tanks and unprotected trucks were soon masses of rust.

Another in the chain of needs became apparent. A machine was needed. A machine designed especially for varied horticultural work. A machine designed from the ground up to possess all the capabilities needed with problems designed out or minimized. It must have multiple tanks and a means of switching between tanks. It must be capable of spraying, or feeding or

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This ten-year-old fiberglass prototype tank mounted on a one ton truck is the result of many years of dreams, ideas and planning.

## SPRAYER (from page 44)

treating and performing all three functions on the same job. And materials must not be wasted or be contaminated by contact with each other.

High pressure capability it must have, and high volume. Pressure and volume are essential in spraying and a major key to profit in feeding. Tanks and machine should be of non-corrosive materials, as fertilizer destroys metal, and acid fertilizer is worse. The whole machine must be, in effect, a sealed package to protect the truck that carries it. And since time is a top factor in every operation, a way must be found to save the time lost in waiting for tanks to fill. A machine was needed — a very special machine. It must be efficient and highly versatile, long lasting, and time saving, a machine designed for this special use.

Practical limitations of size and weight made it desirable to get big capacity from small tanks. This pointed to an injector or pro-

portioning system. The use of the injector principle of injecting a chemical stream into a water stream would also almost eliminate the waiting time for tanks to fill. Formula tanks would be quickly filled because of small size, and the water would be pumped from a tank, floatfilled through a water hose from the customer's faucet. Because venturi, or siphon injection is accurate only when flow and pressure remain constant, this simple system must be rejected. Accuracy is imperative, even though flow and pressure must vary widely.

Only a system of two pumps would do. A big pump for water, a small corrosion resistant pump for the chemical and a suitable means of control. This was the idea that met the need. This was the idea that produced a machine making horticultural service convenient and practical.

The machine that emerged did not come into the world in its fully developed state. Rather, it came as any infant comes, in need of development through years of grow-

ing up. Its new control system, a vast improvement over the original, is now four years old and new patents have just been applied for on recent improvements. Its metering system is now completely new for the fourth time in fifteen years. Metering is, of course, a necessity in feeding to give the operator an indication of gallonage. The multiple tanks have been fiberglass for many years, and for almost eleven years now, the entire system has been housed in an all fiberglass van protecting the carrying truck from corrosion.

These machines spray at eight hundred pounds pressure. Switching between formulas, and between spraying and feeding is done in an instant. One ton trucks carry them, yet their ten formula tanks have a total capacity of more than one thousand gallons. More than two thousand gallons of fluid in tree feeding or lawn treating is a good day's work. All materials for normal needs are carried on the truck, and all production is by the operator with no helper. □



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