through any machine shop supply house. The parts that get the most wear on this machine are the chains and sprockets.

This truck was built in our shop. It has a Chevy II, four cyclinder motor with an automatic transmission, Ford front end, and a Jeep rear end.

This spray rig has a Bean pump, a Clark Fork lift, for different heights, and a Bean blower. All the action is controlled from the drivers seat.

We have found air cleaners to be an important factor in the maintenance costs of our gas engines. We have installed paper air filters in most all of our equipment. We also are in the process of changing all of our oil filters to toilet paper filters..

When over hauling the gas engines in our yard equipment, we install cheap cast iron rings.

For those who are planning on building equipment, make sure the parts are available at your local source of supply. Don't use war surplus parts because it's going to cost money when it's time to replace them — machinery won't last forever.

B-I-F FERTILIZER METERING SYSTEM

GEORGE OKI
Oki Nursery, Inc.
Sacramento, California

Since Oki Nursery's fertility program is based on the constant feed system, a more dependable fertilizer metering system was needed. The source of water being from a well we have faced a constant problem of sand in our water raising havoc with the positive metering system as used by many injector pumps.

We at Oki Nursery under the advise and counsel of Mr. Fred Petersen of Soil and Plant Laboratories have installed the BIF metering system. This apparatus is a commonly used technical equipment used by many water districts throughout the country to chlorinate drinking water. All component units were of a stock shelf item and only fertilizer was used instead of the chlorinating reagent.

These are the 3 basic pieces of equipment necessary.

a. The transmitter which responds to a differential pressure created by a primary flow element of the "DALL" flow tube and donverts the pressure differential into time impluses proportionate to flow accuracy is ± 0.1% of maximum flow.
b. The Dall flow tube is a differential producing primary flow metering element to accurately measure water flow.
c. The 1210-05 Duplex Chem-O-Feeder is a duplex head chemical proportioning diaphragm pump of the positive displacement type. It is equipped with a positive dial stroke adjustment on each head and the repeatability of setting is assured by micrometer screw adjustments.

The advantage of this BIF System are many fold.

1. Ease of operation.
2. Accuracy ± 0.1% of water flow.
3. Versatile, i.e. one head may be used to meter nitrogen, the other potash or otherwise with different proportioning ratio.
4. A second pump may be added to the transmitter to meter for water correction, i.e. sulfuric acid.
5. Minimum maintenance.
6. Installation ease. With the technical staff of BIF only a pipe filter is needed.
7. Cost. The entire installation of the unit is $1500.00 plus piping costs, approximately $100.00.

Since the installation of this equipment we have had more accuracy in the application of either nitrogen or potash since each suction tube of the Chem-O-Feeder is placed directly into a solution of 20-0-0 or potash as delivered from the manufacturer and the dosage is adjusted by the micrometer screw settings. This then eliminates the inaccuracy of mixing various fertility strengths as before. This particular method of fertilizer metering is another endeavor to grow better plants more economically for the ever increasing consumer.

MECHANIZED IRRIGATION FOR NURSERIES

LARRY J. BOOHER, *Extension Irrigationist*
N. W. STICE, *Farm Advisor*
University of California

The production of large numbers of plants in containers has created a problem on how to irrigate and fertilize to assure uninterrupted growth. Plants growing in gallon cans are now irrigated by overhead sprinkler systems, and proportioners are available to inject fertilizers into the irrigation line. Trees growing in 5 and 15 gallon containers are being watered by hand, which is too slow and costly.

The Oki Nursery of Sacramento decided to build a system to irrigate 15 gallon containers and asked for assistance in designing it. They wanted the system to irrigate 12,000 containers from a pump delivering 200 g.p.m. containers to be spaced on 4 foot centers.

The first step was to determine the amount of water needed and the rate of application to uniformly wet the soil mix in the container. Plastic tubing with 1/16 and ⅛ inch inside diameter was tried, but at low pressure the rate of application was too slow. There was no spreading in the coarse soil mix, so the water traveled down from the point of injection and ran out the bottom leaving more than 50% of the soil mix dry. In trials with ⅜ and ½ inch plastic tubing, it was found that a flow of at least 1¼ gallons per minute at low pressure to prevent wash-