

Chemical Weed Control Equipment

pumps, power, tanks, booms, and nozzles must fit crop requirements for best results

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Chemical weed control is becoming common practice in California and many different types of equipment are on the market.

For field and orchard work, ditch banks and roadsides, power-driven pumps with 200 to 500 gallon tanks and accessories are required.

High pressure orchard or plunger pumps are not necessary for weed spraying because the pressure required does not exceed 125 psi—pounds per square inch.

The high pressure plunger pumps can be used with the pressure regulator released to 100 psi; and if the regulator will control this low pressure, the machine will be satisfactory.

The centrifugal pump is most commonly used for the weed sprayer because of its low cost, minimum of wearing parts and adaptability to direct drive from small high speed gasoline engines.

The regenerative turbine type pump has an action which produces higher pressure than a comparable centrifugal can produce.

Rotary pumps also are used frequently on weed sprayers. Most are positive action, self-priming and require a bypass regulator.

Flexible impeller pumps are used and finding favor because they are cheap and able to handle lumpy or gritty liquids. Their disadvantages are that they produce relatively low pressure—30 to 50 psi is maximum—and the rubber or composition paddles may deteriorate when pumping oils.

Hydro-pneumatic systems are commonly used for smaller size field sprayers and have the advantage of not pumping liquid through the pump, thus reducing pump wear.

Power for the pumps is most frequently provided by a direct drive gasoline engine.

Power take-off drives are being used, but the versatility of the sprayer is handicapped when coupled to the tractor engine and limited by the interrelation of field speed and pump speed.

Spray Tanks

Spray tanks for weed chemicals are best made from metal. Wooden tanks may absorb toxic chemicals.

Tank size depends on size of boom and

pump and on whether concentrated or diluted sprays are used.

Agitation systems may be either mechanical or hydraulic. The former is most common and generally appears to give most satisfactory results.

Hydraulic agitation is frequently used in connection with a centrifugal pump. The system is satisfactory if sufficient flow is provided.

The entire rig—tank, pump, motor and boom—may be mounted on a tractor or in the back of a truck. Most frequently, the unit is mounted on a trailer frame with rubber-tired wheels.

A three-inch or four-inch pressure gauge with a scale of zero to 150 or 200 pounds should be mounted on the line between the boom and the shut-off valve within view of the operator. Pressure should not vary during application as the discharge from the nozzles will then also vary, causing uneven application.

Booms

Spray booms generally are made of one-inch or two-inch pipe. Smaller pipe is not practical.

Supports must be provided for the boom generally in the form of chain or cable for vertical support and rods to maintain lateral strength. The boom must be mounted to allow variable height adjustments. Boom tips or the entire boom

may be hinged and provided with a spring return to reduce breakage caused by catching the boom on gates, posts and other obstructions.

Nozzles

Nozzles are brought into the boom from the top or side by means of welded nipples or couplings. This leaves a settling space in the boom for dirt particles and also keeps the boom from draining when the main control valve is shut off.

Some operators are using small spring loaded ball valves on each nozzle which open when the pressure exceeds five psi and close when the boom valve is closed and the pressure drops below five psi.

Another recent development is the reversing jet and valve which places a suction on the main boom line when the main valve is shut off and draws liquid back from the nozzles into the boom.

A good quick-shut-off valve should be provided in the main boom line. A screen should be placed in the boom line to reduce nozzle clogging; and when using small nozzles, additional screens are placed at the nozzles, to reduce nozzle plugging.

Nozzles producing a flat fan discharge generally are considered to give most uniform coverage and strongest drive. Cone

Continued on page 16

Ditch bank sprayer mounted on war surplus truck. Booms controlled from driver's seat.



PEACHES

Continued from page 9

190° F. Fruit must not remain in the tunnel more than 40 to 60 minutes before it comes out at the cool end.

After predrying, the fruit is cooled 10 to 15 minutes before being sulfured to increase sulfur dioxide absorption. A fan may be used to cool the peaches quickly. It takes 3½ hours to sulfur blanch peaches, burning 5½ pounds of sulfur per single car of fruit containing about 25 trays.

The cars of sulfured peaches should be placed in the cool end of the dehydrator and kept there until the moisture content is reduced to 25%–28% unless the weather is cool and humid.

Under ordinary weather conditions, in the central valleys of California, peaches will continue to lose moisture after they are removed from the tunnel until they reach a final moisture content of about 20%.

Dehydrater

Any type of fruit dehydrater can be used successfully, providing the humidity does not reach a point where sulfur is lost.

Whatever heating method is used in the dehydrater, equipment must eliminate soot and smoke.

Each dehydrater should have one wet bulb and two dry-bulb thermometers to measure temperature and humidity.

The dry-bulb thermometers should be at opposite ends of the air current, one at the hot–dry–finishing end, and the other at the cool–wet–entering end. The wet-bulb thermometer may be placed wherever convenient but in the direct air flow.

The dry-bulb at the hot end of the dehydrater will give the finishing temperature. When it rises too high there is danger of scorching or otherwise damaging the fruit, shortening its storage life.

If the peaches are taken from the dehydrater with as much as 25% to 30% moisture content, they should remain on the trays for about 24 hours to permit drying to approximately 20%, or to the moisture content required by the packing house before delivery.

In foggy climates this procedure does not apply, since the dehydrated fruit may actually pick up more moisture if allowed to stand on the cars after removal from the dehydrater. In such cases, the hot air temperature in the dehydrater is lowered to about 140° F, and the fruit is then dried to the required low moisture content before being taken from the tunnel for storage.

The dry-bulb, at the cool end, used in conjunction with the wet-bulb, gives data to determine the humidity. The difference

between the cool-end dry-bulb and the wet-bulb thermometer should always be more than 15 degrees. When it is less, sulfur is being lost.

If the tunnel is loaded with too many cars or if they are introduced in too rapid succession during dehydration, the humidity will become excessive, the drying rate will be greatly reduced and sulfur lost.

The best method of determining moisture content is with an electric moisture tester which is recommended for any operator whose volume justifies the initial cost.

After the fruit has reached the desired moisture content and has cooled sufficiently for easy handling, it should be scraped from the trays and stored.

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Detailed recommendations and detachable temperature charts are available in California Experiment Station Circular 381 "Dehydrating Freestone Peaches" which may be obtained without cost from the office of the Farm Advisor or by addressing a request to Publications Office, University of California College of Agriculture, Berkeley 4, California.

EQUIPMENT

Continued from page 7

discharge nozzles are used by some manufacturers for the very fine nozzles, greater uniformity of discharge being the reason for this practice.

Nozzles may be arranged all on one side of the boom; or as is frequently done, alternate nozzles are placed on opposite sides of the boom and slanted toward one another; and double coverage is obtained with the same gallonage.

NEW PUBLICATIONS

A copy of the publications listed here may be obtained without charge from the local office of the Farm Advisor or by addressing a request to Publications Office, College of Agriculture, University of California, Berkeley 4, California.

CALIF. CLINGSTONE PEACHES—ECONOMIC STATUS, 1948, by Sidney Hoos and H. Fisk Phelps. Cir. 385, June, 1948 (27 pages).

CATERPILLARS ATTACKING TOMATO, by A. E. Michelbacher, W. W. Middlekauff, and N. B. Akesson. Bul. 707, June, 1948.

SOILS OF COLUSA COUNTY, by Frank F. Harradine. Lithoprinted, June, 1948.

HYDROLOGIC STUDIES IN COACHELLA VALLEY, by M. R. Huberty, A. F. Pillsbury, and V. P. Sokoloff. Lithoprinted, June, 1948.

Pumps, booms and nozzles all have a bearing on the capacity of the sprayer. The capacity and adaptability of the sprayer must be considered carefully.

Spray booms will vary with the job to be done. The length of the boom and the consequent size of the rig will be limited by the increased bulk and expense of tank, pump and supporting members for the long boom.

When large acreages are to be sprayed with high volumes—over 100 gallons per acre—it may be found practical to have several small rigs instead of one very large machine.

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DONATIONS FOR AGRICULTURAL RESEARCH

Gifts to the University of California for research by the College of Agriculture accepted in May, 1948

BERKELEY

Dr. William H. Boynton	Department of Veterinary Science	\$149.60
Rohm & Haas Company	Investigations on the use of pectic enzymes in clarification of wines and juices Division of Food Technology	\$1,000.00
Besler Corporation	Generator "Bes-cub," misc. tanks and valves, and compressor and valves Division of Entomology	
Merck & Company, Inc.	50 milligrams Biotin, 1 gram lysine monohydrochloride Division of Poultry Husbandry	
Shell Oil Company	28 gallons Shell Neutrol heavy soluble oil and 28 gallons of Shell Helix oil 22 Division of Entomology	

DAVIS

Julius-Hyman & Company	Investigations of a new insecticide. Division of Entomology	\$1,250.00
Lederle Laboratories Div., American Cyanamid Co.	Investigations of sulfonamides and antibiotics. Division of Poultry Husbandry	\$5,000.00

LOS ANGELES

Los Angeles Turf Club, Inc.	Turf research program. Division of Soils and Irrigation	\$500.00
Southern California Golf Assn.	Turf research program Division of Soils and Irrigation	\$3,530.00
A. W. Tinker, Hillside Nurseries	Leitz-Wetzlar Field Microscope Division of Irrigation and Soils	