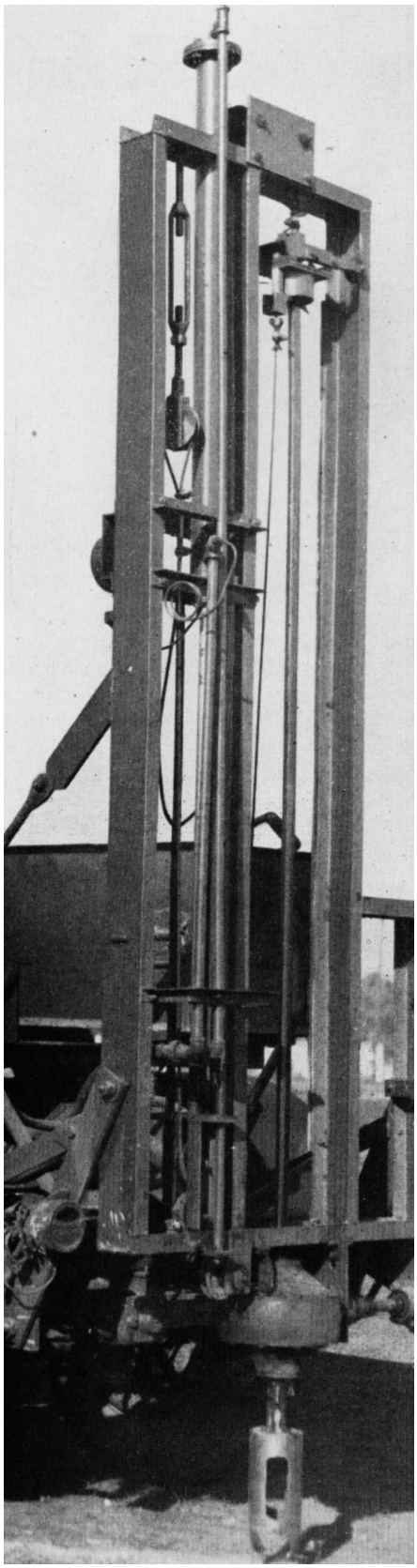

Power-operated Soil Sampler

formulating soil management procedures for their clients.

Soil analysis finds increasing use each day as a research tool, but the time is far away when it can be used generally as a guide to fertilizer practice.

For the present, there is no substitute for observing plant responses to fertilizers under controlled conditions, such as those found in test plots conducted by the Agricultural Experiment Station or Agricultural Extension Service.

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Soil Sampler

power-operated and mobile, new device speeds up soil surveying

Rodney J. Arkley

A POWER-OPERATED soil sampler now does the drudgery in soil surveying—the mechanical job of extracting soil samples which are required by the thousands for an adequate map of a survey area.

The machine is mounted on the rear of a war-surplus weapons carrier, similar to a 1½-ton truck, equipped with four-wheel drive and a power take-off. It consists of three elements.

1. A gear and chain driving mechanism which utilizes power from the truck to rotate a long shaft to which soil sampling bits of various kinds can be attached.

2. An hydraulic mechanism which forces the rotating barrel bit into the soil and removes it when full, operating at pressures up to 2,500 pounds.

3. An hydraulic mechanism which unfolds the device from highway travel position to operating position.

The soil sampler is most advantageous on dry, hard soils.

In comparison of samplings made on the well-known Fresno Alkali hardpan soil it required 6½ minutes of concentrated effort with a pick, shovel, steel bar, and hand auger to obtain a sample 22 inches in depth. Further penetration was effectively stopped by the hardpan.

The power-driven sampler reached the same depth in 1½ minutes; it penetrated the hardpan easily, and a complete soil profile to a depth of five feet was sampled in only four minutes.

Similar results were obtained on the still more dense San Joaquin hardpan soil.

By hand, 11 minutes were required to reach the surface of the hardpan which occurred at 24 inches depth.

The power tool obtained samples to a five-foot depth in only seven minutes.

The mechanical sampler was thus able to furnish important information on the thickness and density of the hardpan which could not have been obtained at all by hand methods.

On dry hard clay soils a five-foot sampling required 20 to 30 minutes of hard hand work, while the power sampler did the job easily in only seven minutes.

No Advantage on Certain Soils

On damp soft soils such as Honcut loam the advantage of the power auger was found to be negligible, as the samples were obtained just as quickly by hand. Moreover the mobility of the machine was considerably restricted by the irrigation ditches and fences which prevail on most soils of this kind.

On Corning gravelly loam, several hours of hand labor were required for obtaining a profile. The power sampler furnished the complete section in 15 to 20 minutes; but where large cobbles were encountered the auger had to yield, often with a broken bit as a result.

The power auger was unable to penetrate the gravelly, concretelike hardpan of the Redding series. Heavier equipment and large heavy worm-type bits are indicated on such extreme soils.

The savings in time and physical energy accomplished with the power auger make it possible for the soil surveyor to devote more attention to studying and recording of the soil characteristics than to digging holes. In addition the areal density of borings is increased many fold.

Rodney J. Arkley is Associate in the Division of Soils, Experiment Station, Berkeley.

The power-operated soil sampler was constructed by C. C. Crothus of Richmond, California, to meet specifications of the Division of Soils.

POULTRY HUSBANDRY

Continued from page 6

warm until used, keeping it uncontaminated with fecal material, and using the proper technique in inseminating. During insemination the syringe should be inserted well into the oviduct—not merely into the cloaca—and the pressure on the hen necessary to expose the oviduct should be relaxed before the semen is injected to prevent its being immediately forced out again.

MEALYBUG

Continued from page 9

covered with a bag and 15 were found on the scions which were uncovered, but shaded with a parasol, again indicating no advantage to the mealybugs on the scions covered with a bag.

At the conclusion of the experiment made in the Encinitas orchard, the dust treatment was continued on the dusted trees, and, of the other six trees, three were painted with a slurry made with 50% wettable DDT powder, and three were painted with a slurry made of a wettable powder containing 10% of the gamma isomer of benzene hexachloride.

The slurries contained one ounce of powder to 100 cubic centimeters of water. They were applied with a paint brush to the tops of the grafted stumps and three or four inches below the top.

The treatments were applied on April 28, 1947, and observations were made on May 21, 1947. On that date, one of the trees treated with DDT dust had 17 mealybugs on the scions and one of the trees treated with the DDT slurry had 10 mealybugs. No mealybugs could be found on any of the other trees.

Resealed Graft Clefts

When a graft cleft seal is cracked, it is the practice to reseal the cleft. Any insecticide applied before the second application of sealing substance is thereby covered over. In the experiment referred to above, it was learned that on the trees on which the mealybugs were seen, the grafting cleft had been resealed with a substance used for that purpose but not repainted with the insecticide. This made a "bridge" for the mealybugs and ants to reëstablish connections with the scions.

In this orchard, as well as in all the other orchards in which experiments were made, it was only on trees on which the graft clefts were resealed after the application of the insecticide that it was possible for the mealybugs to become established.

When graft clefts are resealed, the insecticide should be reapplied on the affected trees.

Walter Ebeling is Lecturer in Entomology, and Associate Entomologist in the Experiment Station, Los Angeles.

Roy J. Pence is Principal Laboratory Technician, Division of Entomology, Los Angeles.

NEW PUBLICATIONS

BEEKEEPING IN CALIFORNIA, by J. E. Eckert. Ext. Cir. 100, revised December, 1947. (96 pages).

THE COMMERCIAL FREEZING OF FRUIT PRODUCTS, by M. A. Joslyn and Leonora A. Hohl. Bul. 703, January, 1948. (108 pages).

COST OF ALMOND PRODUCTION IN CALIFORNIA, by R. L. Adams and A. D. Reed. Cir. 375, January, 1948. (22 pages).

HOME ECONOMICS AT THE UNIVERSITY OF CALIFORNIA, by the Departments of Home Economics at Berkeley, Davis, Los Angeles, and Santa Barbara. Brochure. (18 pages).

SOILS OF A PORTION OF PALO VERDE VALLEY (Between the Levee and the River), by Walter W. Weir and R. Earl Storie. Lithoprinted, August, 1947. (14 pages).

CITRUS THRIPS

Continued from page 11

The addition of benzene hexachloride to Black Leaf Dry Concentrate was of no benefit.

All DDT wettable powder suspensions gave only slightly better control than Black Leaf 155-sugar sprays.

This is in contrast to the results obtained in the first experiment where DDT wettable powder sprays were markedly better than nicotine-sugar sprays. A spray containing 20 pounds of 50% DDT wettable powder per 100 gallons gave slightly better control than one containing eight pounds. As in the first experiment the DDT-kerosene emulsion spray was less effective than the DDT wettable powder suspension.

Vedalia Beetle

A fairly large acreage of citrus in the Coachella Valley has been treated experimentally with DDT each year since 1944 and thus far, there has been no abnormal increase in the population of cottony-cushion scale, in any of the plots, as a result of killing off the predacious vedalia beetle.

The plots have been widely scattered over the citrus-growing area so it is not possible, at this time, to predict what might happen if the entire citrus acreage were treated with DDT.

It is definitely known that the vedalia beetles are very susceptible to DDT and until more information is developed on the length of time DDT residues will kill this beneficial insect, care should be used in applying sprays containing DDT.

Recommendations Limited

Because of the many factors that are as yet unknown about DDT applications on citrus, it is not recommended for general use. It should not be applied commercially, for the control of thrips, in groves where nicotine-sugar sprays have given satisfactory results.

In groves where nicotine-sugar sprays have failed to give satisfactory control, growers may wish to apply DDT. In such cases, eight pounds of 50% DDT wettable powder per 100 gallons of water per acre, applied with the spray-duster, should be used.

Further experimental work is under way in the Coachella Valley, using DDT as well as other promising materials.

W. H. Ewart is Assistant Entomologist in the Experiment Station, Riverside.

The initial experiments mentioned in the second paragraph were conducted by C. O. Persing, then Assistant Entomologist in the Experiment Station, Riverside.

DONATIONS FOR AGRICULTURAL RESEARCH

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

BERKELEY

Air Reduction Sales Co. — 10 grams dl-ethionine RL 471120
Division of Poultry Husbandry

Dow Chemical Co. — 2 quarts Dowklor 40% Emulsifiable
Division of Entomology

Stockton State Hospital — Milking cow, Tag No. 1719
Department of Veterinary Science

Sugar Research Foundation — $880.00
Division of Plant Nutrition

Swift & Co. — $20,000.00
Department of Veterinary Science

DAVIS

Canners League of California — $276.33
Production of stock seed from two improved asparagus strains
Division of Truck Crops

Julius Hyman & Co. — $1,250.00
Investigations of a new insecticide
Division of Entomology

U. S. Public Health Service — $1,294.90
Rodent Control
Division of Zoölogy

LOS ANGELES

W. Atlee Burpee Co. — $50.00
1947–1948 W. Atlee Burpee Award in Horticulture