

### New method for measuring

#### MOVEMENT OF SOIL WATER

The techniques of measuring the density of soil by gamma radiation offer a possible new method for water determinations that overcomes the disadvantages of most other methods—lack of accuracy, lag in water changes, insufficient range, disturbance of soil water system, poor resolution and necessary destruction of system.

The gamma radiation method of measuring should be especially valuable in the study of unsaturated transient water flow problems because the soil system will not be disturbed and a measure of water contents over all space and time can be obtained. The laboratory apparatus necessary for the experimental measurement of soil water movement by the gamma radiation method is being constructed.—*D. R. Nielsen, Dept. of Irrigation, Davis.*

#### SEEDLESS WATERMELONS

in southern California

Five lines of seedless watermelons, representing the types commercially available, were tested at Riverside and Hemet in 1959 and in 1960 to evaluate the crop for commercial and home garden production. Cultural operations were the same as for commercial watermelon varieties, except that seedlings were started in the greenhouse and transplanted to the field. Pregermination and transplanting were advisable due to low germination—10%–50%—and reduced seedling vigor when field seeded. Early plant growth was slow, but later the vines covered the ground in a 9' × 9' spacing.

Fruit of the five lines varied from round to oblong in shape, and had gray to striped green rind color. Fruits averaged 10 to 12 pounds, with individual melons weighing up to 18 pounds. Quality was very satisfactory as measured by sugar level—11%–12%—and by general features of flesh flavor, texture and color. Yields of the seedless types averaged 10 tons per acre.

Excellent consumer acceptance of seedless watermelons coupled with satisfactory yields indicate this specialty crop to be suitable for home gardens and for commercial production in California.

Cost of seed varies from 2¢ to 10¢ each, dependent upon quantity purchased. Seedless watermelons are produced by crossing diploid watermelons—plants with two sets of chromosomes—with tetraploid types—four sets—resulting in triploid seed and plants—three sets. The pollen from triploid plants is not viable, necessitating interplanting of seedless varieties with diploid varieties in the ratio of five seedless to one diploid to effect pollination and fruit set. Seedless watermelons develop only rudimentary seed, comparable to immature seed in slicing cucumbers.—*L. F. Lippert, Dept. of Vegetable Crops, Riverside.*

### Principal damage of

#### GREEN APPLE APHID

The principal damage to apples caused by the green apple aphid in California is the insect's copious secretion of honeydew which may contaminate the fruit.

For the past three years field studies have been conducted in the Watsonville area with the primary aim of establishing an economic level of infestation for this aphid. The species is found in greatest abundance on the tender foliage at the tips of the apple shoots. However, indications are that high aphid populations restricted to the tender terminals do not necessarily result in damaging honeydew deposits on the fruit. When the populations reach a high level on the terminal leaves, many of the aphids move to the older leaves. Under some conditions the aphid population on mature and senescent leaves can be very high. Experimental data indicate that the presence of the apple aphid on the older foliage will provide a more accurate index in determining what populations of this aphid can be tolerated before damage to the fruit will occur.—*P. H. Westgard and H. F. Madsen, Dept. of Entomology and Parasitology, Berkeley.*

### Mechanical

#### GRAPE HARVEST

Assimilation and evaluation of research data indicate that mechanical harvest of grapes is economically feasible.

Research was initiated in 1952 and vine training met with early success. Varietal and cultural practice differences required special attention. Most adaptable to mechanical harvest are long stemmed varieties which are spur pruned and possess few tendrils.

A Tee-shaped trellis evolved and the fruit is borne in a band on each side of and parallel to row centerline. This type of trellis requires that row spacings be increased in order to maintain working space between rows. A trend from the 12' × 10' to an 18' × 8' planting is expected.

Harvester principles of cutting, steering, fruit cleaning and a uniform lay are being improved. The lay will be on a continuous paper tray which can be turned and picked-up by a commercially available machine. Past experience has included both raisin and wine harvest.

Mechanical harvest of long stemmed, spur pruned varieties such as Malaga and Aramon can result in annual cost savings of \$21 per acre. The harvest labor requirement will drop from about 40 man hours per acre to less than one man hour per acre. Because of a need to disentangle the clusters, about 15 man hours per acre are expended during the May-June-July period. The Thompson Seedless grape with its medium length stem is considered marginal for mechanical harvest. Vine breeding research is a must in order to provide quality fruit adaptable to mechanical harvest.—*A. J. Winkler and L. H. Lamouria, Depts. of Viticulture and Agricultural Engineering, Davis.*

### Black-eyed peas as

#### SWINE FEED

Twenty-four growing hogs with an initial weight of about 80 pounds were fed a control ration and rations containing 20% and 50% ground black-eyed cowpeas for an experimental period of 70 days. As the percentage of black-eyed peas increased, gain in weight decreased. The pigs on the ration containing 50% black-eyed peas gained about 38% less weight than the controls. Feed consumption and utilization were apparently reduced by the addition of black-eyed peas. There was no evidence of toxicity.—*Hubert Heitman, Jr., Dept. of Animal Husbandry, Davis.*