Insecticides May Cause Invisible Injuries To Plants

(Continued from page 1)

sprayed and where there is no opportunity to make comparisons with non-sprayed plants that are not dwarfed or with sprayed plants that are severely dwarfed.

Some insecticides are reported as having a stimulating effect on the growth of the plant — toxic substances in small doses usually have— but it is probable that most of them in the amounts applied have either a temporary or permanent depressing effect.

Poisonous Residues

Some poisonous insecticides may accumulate in the tissues of the plant in such large quantities that it can not be used as food. Selenium and selenium compounds and some forms of arsenic fall into this class.

Plants are especially selective with reference to such compounds as these. Some will absorb almost none while others will absorb and accumulate large quantities.

Emulsions of the lighter fractions of kerosene, effective in killing certain insects, showed no apparent injury to the foliage, but sometimes proved to be disastrous because they ran down the trunks of the trees and killed the bark, usually just below the surface of the soil.

New Insecticides

It is possible, if not probable, that the new insecticides may produce internal rather than readily visible external injuries to the plant.

The large number of new insecticidal compounds now on the market, with an almost unlimited number in the offing, makes it important that their possible internal effects on the plant be determined.

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Spinach Harvest Increased By The Use of Nitrogen

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and lighter soils, 600 pounds produced considerably higher yields.

Nutrient Analyses

The data obtained from nutrient analyses made on the petiole tissue support the yield data obtained.

When nitrogen applications resulted in increased yields there were marked increases in the nitrogen content of the petiole tissue.

It should be pointed out that the tests this year were conducted during an abnormally dry season when there was practically no leaching of soil nitrates by winter rains.

In seasons of excess rainfall, even greater results might be expected from nitrogen.

Nitrogen Sources

Sources of nitrogen was an important factor in determining yield. In over half of the tests conducted in northern California, higher yields were obtained with nitrate of soda than sulphate of ammonia.

This is illustrated by the yields from several experiments where rates of 60 pounds of nitrogen per acre were compared.

In one test the yield from sulphate of ammonia was 9.5 tons per acre as compared to 11.8 tons from nitrate of soda.

In another test the yields were 3.5 and 4.4 tons from sulphate of ammonia and nitrate of soda, while in a third test, comparable yields from the two sources were 6.2 and 7.7 tons respectively.

In some tests as high, or higher, yields were obtained by applying 60 pounds of nitrogen per acre from nitrate of soda than from double the amount of sulphate of ammonia.

Plants fertilized with nitrate of soda often showed greater nitrate content in the petiole tissues than those given sulphate of ammonia but this was not always the case.

O. A. Lorenz is Assistant Professor of Truck Crops, and Assistant Olericulturist in the Experiment Station, Davis.

Different Areas Of Watermelon Studied To Determine Varying Amounts Of Sugar Content

John H. MacGillivray

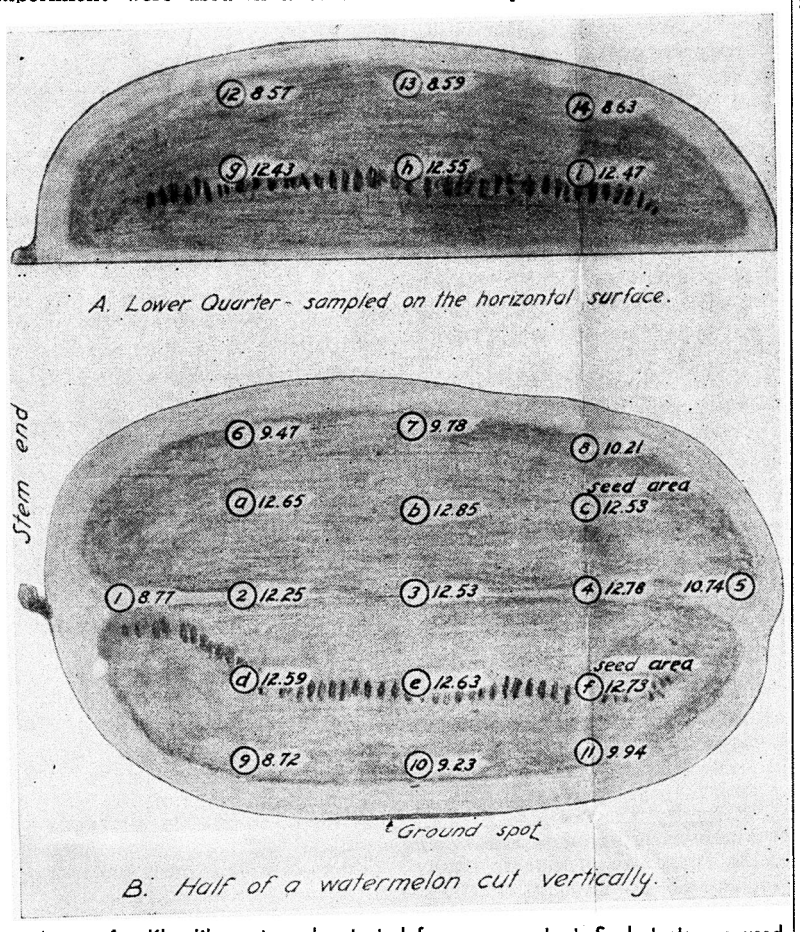
The soluble solids content of watermelons appear to be closely related to the sugar content.

Judging from previously collected data, 85 per cent of the soluble solids in Klondike watermelons consists of total sugars.

An accurate method of determining soluble solids is especially valuable to anyone studying the effect of this quality factor, both in improvement programs and in work on the effect of environment on the quality of the watermelon.

Klondike Variety Tested

Watermelons from an irrigation experiment were used in a soluble solids test project. Both non-irrigated and heavily irrigated melons of the Klondike variety were included. Previous studies have shown that, at Davis, irrigation does not greatly affect soluble solids content. All comparisons in this report were between readings made on the same melon.



Areas of a Klondike watermelon tested for sugar content. Such tests are used in making comparative examinations of varieties and in improvement trials.

For the determinations, the melon was placed with the ground spot on a table and cut into equal halves vertically from stem to blossom end. The areas shown in **B** of the accompanying illustration were then sampled. Sample areas in the red flesh were given numbers whereas those close to seed regions were indicated by small letters of the alphabet.

The sampled half was then laid on the table with the cut surface uppermost. The melon was cut vertically from stem to blossom end into two quarters. The cut surface of the quarter having the ground spot was sampled as shown in **A** of the illustration.

All samples were obtained from the edible flesh even though close to seed or rind. The juice was expressed by hand from a cube of the flesh about one-half inch on each side.

The soluble solids content of each sample was determined with a hand refractometer. A scale on this instrument gives the per cent solids of pure sucrose solutions. The readings thus obtained are called, in this article, soluble solids.

The edible flesh was removed from the two quarters used for the small samples, and the juice was extracted by hand pressing of the flesh in a piece of cheesecloth. The soluble solids content of this juice—11.23 per cent—was considered representative of the whole melon.

23 Samples Tested

In each of the 23 watermelons used in this experiment, 23 areas were sampled. The data indicate a marked decrease in the sugar content as the samples approach the rind from the seed area.

High soluble solids are found in the center flesh of the melon, including the surrounding tissue near the seed area. These values which vary from 12.25 to 12.85, average 12.59 per cent soluble solids.

The flesh near the rind is low in soluble solids, varying from 8.57 to 10.74 and averaging 9.33 per cent. The blossom end is almost two per cent higher in solids than the stem end. Likewise, the samples near the upper rind are higher than those near the ground.

The watermelon fruit seems to be consistently variable in soluble solids content.

To compare or improve varieties as to quality, there must be a method of obtaining an adequate sample. For some light on this problem, one may compare the results obtained from the individual samples and the soluble solids content of the juice from the half melons.

The juice from the halves averaged 11.23 per cent soluble solids. The average for all the small samples —one to 14 and **a** to **i** in the illustration—is 11.06 per cent. When the average value of the melon was determined by averaging the 23 small samples and compared with the value for the half melons, there was found a significant difference.

Since the odds in this case were 103 to one, evidently the 23 samples include too large a proportion of those near the rind. On the other hand, averaging the seventeen samples from the half—one to 11 and **a** to **f**—of the melon, one finds a value of 11.22 per cent, which is not significantly different from our value for the half melon sections—11.23 per cent.

If individual regions are compared within a given melon, a difference of about 0.6 per cent solids is necessary for a significant difference, with odds of 19 to one.

Care In Sampling

None of the 23 areas selected had an average value of 11.23 per cent. Twelve of the percentages are higher, and eleven are lower. If for sampling, one must choose a sector that is similar in composition to all the juice, it will have to be located between the rind and the seed region. Such a sector might lie between samples four and five in **B** of the illustration.

Area three, which has been used for sampling many melons, is desirable from the standpoint of the small variation from the surrounding tissue. One should remember that this area is 1.3 per cent higher in soluble solids than the general average.

In a fruit so variable as the watermelon, the choice of one area for sampling must involve certain dangers of inaccuracy in determining results.

John H. MacGillivray is Associate Professor of Truck Crops and Olericulturist in the Experiment Station, Davis.

Brucellosis Effect On Reproduction In The Swine Herd

H. S. Cameron

In addition to being an important factor in public health, swine brucellosis interferes seriously with economical pork production.

During investigations on the disease in a herd, an opportunity afforded itself to determine the extent of the loss.

Negative Herd Established

Bucellosis was diagnosed in the herd by blood test. A non-infected group was established with negative gilts unexposed to infection since weaning. When pigs were weaned from the positive group the sows were culled. In this manner a negative herd was readily established within a year.

Records Show Results

Excellent records being available a comparison was made between two months in 1945, when the herd was infected, and two corresponding months in 1946, when the disease had been eradicated.

The following table shows the results of the survey.

Production Records Prior to and Following Eradication

1945	
September	
26 positive sows bred	
54 pigs born	
* Average	2.0
49 negative sows bred	
277 pigs born	
* Average	5.2
October	
23 positive sows bred	
117 pigs born	
* Average	5.0
31 negative sows bred	
206 pigs born	
* Average	6.6
1946	
After Brucellosis had been eradicated	
September	
49 sows bred	
341 pigs born	
* Average	7.0
October	
37 sows bred	
297 pigs born	
* Average	8.0

* Average based on sows bred.

A summary indicates that during the two months when the herd was free from brucellosis the litter size averaged 7.4 pigs compared to 5.1 during the months when infection prevailed.

Public Health has rightly been advanced as a reason for eradicating swine brucellosis; but the effect on pork production is more likely to influence the breeder. To him an increase of at least two pigs per litter is of vast economic importance as a grower.

H. S. Cameron is Associate Professor of Veterinary Science and Associate Veterinarian in the Experiment Station, Davis.

ABSTRACTS OF NEW PUBLICATIONS

IRRIGATED PASTURES IN CALIFORNIA, by Burle J. Jones and J. B. Brown. Cir. 125, revised June, 1947. (48 pages).

Good irrigated pasture, grazed at the right stage of growth for maximum food values, has been shown to produce more milk than does hay, or even hay and concentrates.

Types of irrigation vary with differences in soil, land contours, and available water supply. Strip checks are best for smooth, gently sloping land; contour checks better for flat lands. The principal cash costs are for water and irrigation labor.

A pasture operator should maintain an adequate stand and balance of legumes and grasses through as much as possible of the pasture season. Many producers who have a dense resident stand of grass add to it a legume to enrich the feed. Several species are suitable for irrigated pastures, the particular mixture depending upon costs, soil and climatic conditions, and topography.

Recent studies show that irrigated pastures do not provide enough dry matter. Dry feed supplements are necessary to keep down bloat hazard in cattle and sheep. In addition, irrigated pastures are especially good breeding grounds for parasites, but if the operator will take certain routine measures to suppress them and prevent infection, the pasture may yet be used to advantage.

Pasture management, land and seedbed preparation, and cost studies for irrigated pastures are discussed in this circular. The publication also includes a complete listing of recommended general- and special-purpose legume and grass mixtures for each California county, and a description of four livestock parasites, with a discussion of treatment and preventive measures. This circular is now available at the College of Agriculture.

2,4-D AS A WEED KILLER, by W. A. Harvey and W. W. Robbins. Ext. Cir. 133, revised June, 1947 (12 pages).

The second edition of this publication is now available. Although it is substantially the same as the first edition, some new material has been added.

This includes a description of the use of 2,4-D for the control of wild morning-glory, a plant highly susceptible to the compound.

Morning-glory may be effectively controlled on grain land by spraying the weed on the field in the fallow year, or by spraying it in the growing grain. Neither of these methods alone will result in eradication, but due to the low cost of the chemical, the control achieved is definitely profitable.

A section of recommendations for specific amounts of 2,4-D to be used in the control of certain weeds, and of weeds in grain crops, has also been added to this edition.

This publication is now available at the College of Agriculture.

DONATIONS FOR AGRICULTURE RESEARCH

Gifts to the University of California for research by the College of Agriculture, accepted in June, 1947

BERKELEY

Gary Brown — 2 cartons DDT depositor
Division of Entomology and Parasitology
William O. Buettner — $ 10.00
Division of Entomology and Parasitology
Earl Cannon — 5 gals. Ortho K Global N. W. oil
Division of Entomology and Parasitology
E. O. Corson — $ 10.00
Division of Entomology and Parasitology
E. T. Doyle — 5 cases agricultural insecticide dry in packages
Division of Entomology and Parasitology
Fontana Farms — 19 newborn calves
Division of Veterinary Science
R. S. Glover — 15 lbs. Hercules Toxaphene 40% dust
Division of Entomology and Parasitology
G. B. Gnadinger — 600 lbs. dry multicide dust; 600 lbs. F 570 Dust 5%; 600 lbs. F 570 Dust 10%
Division of Entomology and Parasitology
V. H. Montgomery — $ 10.00
Division of Entomology and Parasitology
National Pest Control Assn. Inc. — $ 100.00
Division of Entomology and Parasitology
New York Pest Control Assn. Inc. — $ 25.00
Division of Entomology and Parasitology
Rohm Haas Corp. — 50 lbs. Rothane 50
Division of Entomology and Parasitology
Sturgeon Pest Control Co., Inc. — $ 10.00
Division of Entomology and Parasitology
Swift and Co. — $2,000.00
Division of Poultry Husbandry

DAVIS

Sam La Fata — 2 tons of wine grapes
Division of Viticulture
Wine Advisory Board — $10,000.00
Division of Viticulture