earlier and larger carrots than the non-foil covered plots. All plots were infested with root knot.

From the results to date the beneficial effects of foil mulch on crop yield as shown here are probably the result of the interaction of the following phenomena: (1) conservation of moisture, (2) protection of soluble fertilizer salts against leaching, (3) reduction of soil temperatures, and, (4) the control of weeds.

TRANSITORY EFFECTS OF 2,4-D ON THE WATERMELON PLANT WHEN ABSORBED THROUGH THE ROOTS

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Watermelon seeds were planted in Norfolk sand at Whitney, Florida, on the farm of this laboratory on July 5, 1950. The purpose of so late a planting of one acre of melons was to obtain F_1 seed from melon crosses made in the spring crop. We speed up our watermelon breeding program by this method, which has been employed in previous years.

The seeds germinated rapidly and had emerged by July 11. By July 26 many weeds were competing with the young melon plants. It was decided to eliminate the weeds, mostly Florida Pusley *(Richardia scabra)* and volunteer hairy indigo *(Indigofera hirsuta)*, by the application of 2,4-D. Each melon hill was covered with a papier-mache' meat tray to protect the melon plants from the weed-killer. The melon seedlings were small enough to permit this without physical damage by pressure. An amine 2,4-D spray was applied to the soil with

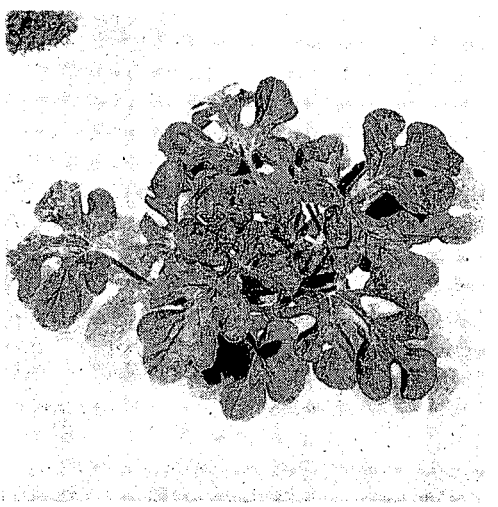

Fig. 1-A. Top view of normal watermelon plant. Compare with Fig. 1-B.

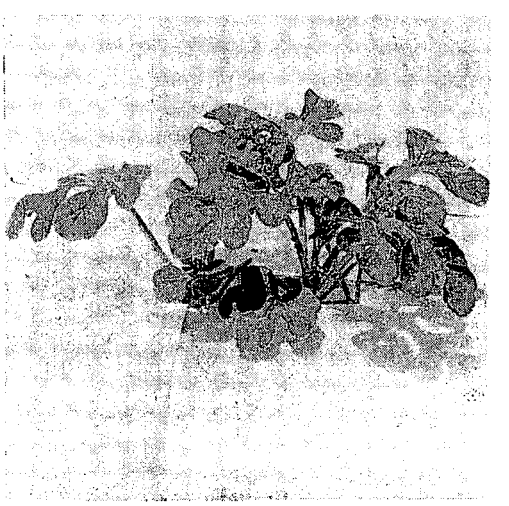

Fig. 2-A. Side view of normal watermelon plant. Compare with Fig. 2-B.

a 3-gallon sprayer, calibrated to deliver 60 gallons of solution per acre, at 40 to 50 pounds pressure. The rate of application was approximately ½ pound free acid equivalent per acre. Care was taken to avoid excessive spray application near, or on, the paper cover over the melon plants. In a few cases, where the 2,4-D spray accidentally fell on melon foliage, injury occurred. The papier-mache' covers were removed soon after the soil was sprayed.

By July 31 it was apparent that excellent control of the Florida Pusley was being obtained. Other than a few accidentally injured melon plants mentioned above, all seedlings appeared normal and growing. From July 26 to July 31 slightly less than one-third of an inch of rain fell on the treated plot. On August 2, there fell 2.58 inches of rain, on August 5 there fell 0.21 inches, and on August 6 there fell 0.34 inches. Two showers of less than one-tenth of an inch each fell on August 9 and 10, and on August 11 there was measured 1.21 inches. From date of application of the 2,4-D (July 26) until August 11, a total of 17 days, the treated plot received more than 4 and one-half inches of rain. The soil being sandy, the rain penetrated quickly and deeply. The maximum air temperature during this period varied from 77° to 92° F., and the minimum from 69° to 76°F.

Definite abnormal growth characteristics appeared by August 3 on the melon plants in areas where the soil was sprayed. Melon plants on adjacent unsprayed soil appeared normal. The Florida Pusley was now dead. Symptoms of 2,4-D injury to the melon plants included dwarfing and thickening of the first true leaves, a prominent whitish venation, a curling under of the leaf margins, and definite elongation of the petioles of affected leaves. Less noticeable symptoms included a pimpling of the surface of otherwise normal leaves. Typical injured plants are shown in Figures 1 and 2.

Stunted plants survived and in fact grew more rapidly than expected, coming out of the shock condition by August 25. By September 1 it was clear that the plants would bear flowers and fruit nor-

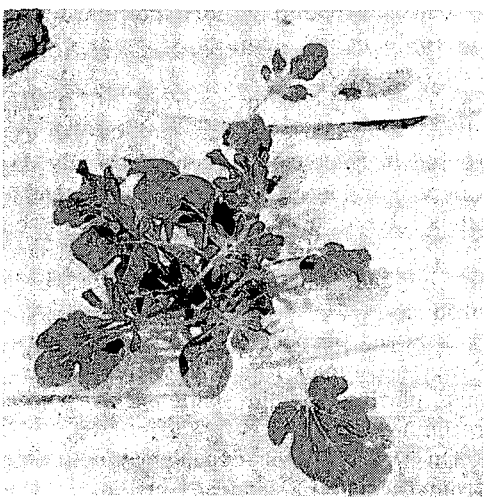

Fig. 1-B. Top view of 2,4-D affected watermelon plant. Compare with Fig. 1-A.

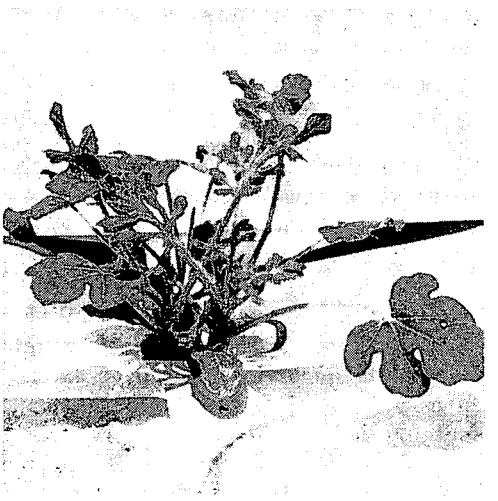

Fig. 2-B. Side view of 2,4-D affected watermelon plant. Compare with Fig. 2-A.

mally, and this has proved to be the case.

It is concluded that the symptoms shown by the watermelon plants were brought about by varying amounts of 2,4-D absorbed by the roots. The absence of stem and petiole curvatures, the norm when surface application of 2,4-D is made to a plant, confirms this diagnosis. Further, the extreme care taken in application obviated contact of the weed killer with the foliage or stems of the melon seedlings.

We are presenting this paper to show that small quantities of 2,4-D can be absorbed by watermelon plants from the soil through the root-systems, when weed-killers are applied with the plants *in situ*. The same or a similar response may occur when the soil is sprayed to eradicate weeds, and melon seeds planted later. However, the injuries described are of a transitory nature only, for the affected plants grew out of the condition and flowered and fruited normally.

PROCESSING SECTION

COMPARISON OF PLATING MEDIA USED FOR THE ESTIMATION OF MICROORGANISMS IN CITRUS JUICES[3]

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The production of frozen concentrated citrus juices requires a certain amount of routine bacteriological control work, most of which is concerned with the common plate count. The significance of a "total" count on any particular sample of concentrate is extremely doubtful since, in many instances, it does not reflect the quality of the product nor the cleanliness of the plant. However, plate counts made at frequent intervals over extended periods of time may give the plant operator information which will allow him to predict how long he can continue to operate before he can expect a build-up of contamination in the equipment.

The desirability of standardizing microbiological techniques is one of the many problems which will eventually confront the manufacturers of frozen citrus concentrates. As might be expected in the case of such a recently developed industry, several recommendations have been made with regard to the proper techniques and media to be used in the bacteriological analysis of these products.

It is the purpose of this report, therefore, to compare the efficiencies of various plating media which have been recommended.

On the basis of experience resulting from the use of separate media for the determination of total counts and yeast and mold counts in concentrated citrus juices, it is evident that the microflora

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