inches), *g*, is detached, and the glass bead and plug, *h*, removed to facilitate filling. The weighed unit is inserted into a long cylindrical glass hood whose side arms connect to the metabolism system. By means of the bead, *i*, the level of the absolute methyl alcohol is maintained at the lower end of the wick, thus insuring a small, non-luminous flame. Near the end of the check, after the spark coil switch has been closed again to avoid escape of unburnt vapors, the supply is discontinued. When the flame dies out, to prevent evaporation, the alcohol in the tube is allowed to drop back into the reservoir created below the bead. Weighings are performed without delay. Used in testing a closed circuit respiratory metabolism apparatus, this method gave on seven checks values of 100 ± 0.5 per cent. for oxygen, carbon dioxide and water.

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DEFOLIATION OF ROSE PLANTS WITH ETHYLENE GAS[1]

INVESTIGATIONS by the Oregon Experiment Station have shown that ethylene gas can be used to remove the foliage from field-grown rose plants. The treatment is used after the roses have been dug for shipment or storage. One Oregon nurseryman has defoliated over 200,000 rose plants by this method this year; 50,000 of these were defoliated in a single room in four days' time. By other methods commonly used by the growers it would have taken several weeks to defoliate this same number of plants.

The fact that ethylene will defoliate rose plants is not new. Wilcox[2] in 1911 reported that illuminating gas would defoliate greenhouse roses. Since that time other workers have noted a similar effect on rose plants grown in greenhouses. In 1931 Zimmerman, Hitchcock and Crocker[3] demonstrated that ethylene present in illuminating gas or pure ethylene would cause epinasty and defoliation of potted rose plants. Roses thus treated would recover and show no effects of the treatment other than the forcing of more of the latent buds.

The above findings have been reinvestigated and procedures developed whereby this same principle can be used on a commercial scale to defoliate large numbers of nursery-grown rose plants. A fairly airtight room or chamber is provided, and ripe apples are used as the chief source of ethylene gas, although the hypanthia of the rose plants are known to produce some ethylene. One bushel of apples is sufficient for each 300 to 400 cubic feet of space. A temperature of 65° to 70° Fahrenheit is maintained during the treatment by electric or kerosene heaters. Where 50 per cent. or more of the space is filled with rose bushes the heat liberated by the rose plants, once the defoliation process has been started, is sufficient to maintain this temperature in insulated rooms. The plants can be stacked close together in large piles of single rows, but they must be kept in a moist condition to prevent wilting of the foliage. Defoliation with most varieties requires three to five days, but a few varieties require a longer treatment.

Numerous tests have been conducted to determine the behavior of rose plants following the treatment with ethylene. Treated and untreated lots of plants have been grown under field and greenhouse conditions. The treatment apparently has no significant effect upon the subsequent growth of the plants.

Preliminary trials with other plants suggests the possible application of the method to a number of nursery stocks other than roses.

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[1] Published as Technical Paper No. 328 with approval of Director, Oregon Agricultural Experiment Station, contribution from Departments of Horticulture and Plant Pathology.

[2] E. Mead Wilcox, Nebraska State Hort. Soc. Ann. Rept., pp. 278–285, 1911.

[3] P. W. Zimmerman, Wm. Crocker and A. E. Hitchcock, Contr. from Boyce Thompson Institute, 3: 459–481, 1931.

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