APPARATUS FOR EXTRACTING PLANT SAP

R. O. Gifford, R. H. Ruf, Jr., and R. E. Eckert, Jr.*

For analyses of chemical or osmotic status of plant tissue, a sample of plant extract must be obtained. By modern methods of microchemical analysis, determinations can be made with a very small quantity of plant extract or sap. McComb and Rendig described a simple technique for extracting juice from plant tissues. The plant tissue is inserted in a short length of tygon tubing, closed at one end, the tissue crushed in the tubing and the juice squeezed to the other end.

In studies of the osmotic adjustment of plants, many samples of plant tissue were analyzed. To reduce the time and labor required to obtain the necessary extracts, a device was constructed for squeezing plant tissue.

The apparatus consists of two gear-driven steel rollers, between which the samples are crushed in tygon tubing. The pressure on the samples can be changed by adjusting the spacing of the rollers. The outer frame (A in Figure 1) which supports the rear roller B can be moved relative to the inner frame (which supports the front roller) by means of the screw at the front of the unit. The gears are slightly larger than the rollers and mesh properly with tubing of 1/16-inch wall thickness.

The apparatus was constructed from standard sized steel stock except for the gears. No bearings were necessary; lubrication of the machined steel surfaces through oil holes was adequate.

This apparatus was used successfully to extract sap from potato stems and petioles and from culms of crested wheatgrass. The amount of juice expressed depended both on the pressure applied and on the amount of sample employed.

AN INEXPENSIVE CIRCULATING-SOLUTION CULTURE APPARATUS

John E. Fučík and John S. Titus

Of the many references describing experimental or commercial nutrient solution systems for plant culture, few involve circulation of the solution and these generally employ pumps and specialized aerating devices. In the system described here, air, under pressure, serves to circulate as well as aerate the nutrient solution.

The apparatus is diagrammed in Figure 1. Air at 15 to 16 psi is introduced into the main nutrient solution reservoir.

Figure 1. Apparatus for extracting plant juice. (Frame A and roller B are movable)

Figure 1. Diagrammatic sketch of circulating-solution nutrient culture system.

Notes:

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2 Assistant Soil Physicist and Assistant Horticulturist, University of Nevada, and Range Conservationist, Crops Research Division, ARS, USDA, Reno, Nevada.


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6 Instructor and Associate Professor of Horticulture, University of Illinois, Urbana.

