BRIEFS

Short reports on current agricultural research

Electronic devices to detect

FRUIT MATURITY

An adapted spectrophotometer has made it possible to pass light of relatively pure chromaticity, or color, through whole peaches, nectarines, and plums. The amounts of light absorbed at different wavelengths appear to vary with the maturity of the fruit. A ratio of the amount of light absorbed at two different wavelengths can be utilized to eliminate the effects of differences in fruit size or opaqueness. Although additional research is necessary, there is promise that such a device may be utilized in the rapid separation of some fruits into several maturity categories.

Being investigated for the first time in its possible application to the detection of fruit maturity is the phenomenon of chemiluminescence — the result of chemical action within the fruit which causes the return of a certain minute portion of the applied light energy that is readily detected by sensitive phototubes. In contrast to the direct physical nature of fluorescence, chemiluminescence is dependent upon enzymatic reactions and may well reflect the physiological state or maturity of a tissue.—*Roger J. Romani, Dept. of Pomology, Davis.*

Flight patterns of the

PEACH TWIG BORER

Peach twig borer moths do not enter bait traps in the manner of codling moths or oriental fruit moths. As a consequence, the flight patterns of the twig borer are not known. In 1959, exploratory work indicated that it was possible for an experienced observer to make a direct count of twig borer moths on the bark of host trees, and that this count apparently could serve as a reliable index of the moth population in the orchard.

To test the usefulness of this technique, moth counts were made at frequent intervals during the 1960 season in an almond orchard at Davis. Results were encouraging. Three distinct flights were detected. The first occurred from mid-April to early June; the second from late June through July. The third flight developed abruptly during the second week in August and was very much stronger than either of the two earlier flights. Sample counts of moths obtained during the peak of the flight, in late August, were about ten times as high as counts obtained earlier in the season.

Judicious use of this technique should enable entomologists to plot flights of this moth, to test the effect of insecticides on moth populations, to estimate levels of infestation, and to use moth flight data to predict the appearance of larval broods during the growing season.—*Douglas W. Price, Dept. of Entomology, Davis.*

New method for studies on

IRRIGATION EFFICIENCIES

Irrigation efficiency, from the engineering and economic standpoints, is under study for more precise information on the use of water for agriculture. Recently developed methods for determining the flow of water in furrow and border irrigation systems by mathematical equations have been tested for several seasons under field conditions and have proved to be accurate and simple.

The equation method will be used to prepare detailed information describing the characteristics and performance of any irrigation system as affected by soils, flow rate of water, field slope, and crop. With such information comparative economic situations also can be analyzed and the labor energy and capital available can become a part of the irrigation design.—*J. R. Davis, Dept. of Irrigation, Davis.*

Blanching as an aid in

DEWATERING FORAGE

To make one ton of hay from freshly cut forage requires the extraction of about 6,000 pounds of water. A pressing process can rapidly remove as much as 5,000 pounds of this water.

If fresh forage is placed between two flat plates and pressure applied, liquid will be expressed. If the forage is blanched prior to pressing, a larger proportion of the total water in the forage will be removed and the amount of protein and dry matter contained in the expressed liquid will be reduced.

With alfalfa there may be expected losses of about 15% of the dry matter—5% of the liquid removed—as well as a small decrease of digestibility and an increase of the protein content of the pressed solid material.

Maximum dryness achieved ranged from 43% to 38% moisture, so final drying for storage would be necessary.—*William Chancellor, Dept. of Agricultural Engineering, Davis.*

Home pear roots are not affected by pear decline. There are approximately 30,000 pear trees on Old Home roots in the Medford, Oregon, area that are unaffected by pear decline. The apparent resistance of Old Home rootstock to pear decline, together with methods developed for propagating by hardwood cuttings, make Old Home a likely candidate for a replant rootstock. However, Old Home like other common pear varieties is probably universally infected with a vein-yellows virus which causes reduced vigor and stunted trees, particularly in Comice and Anjou. Furthermore, recent surveys indicate that in California, Bartlett trees on Old Home roots have a high incidence of measles, a condition believed to be caused by a virus and which may reduce the pear crop by one-third to one-half.

Bartlett variety on its own roots, thereby eliminating a graft or bud union, might be unaffected by pear decline. However, Bartlett can be rooted only with great difficulty. Studies are under way to develop commercially practical methods for rooting, even though Bartlett on its own roots would be less desirable than Old Home because of its susceptibility to fire blight.

The situation seems to be an emergency so all factors which might conceivably be contributing to pear decline should be investigated as quickly as possible. The extensive studies under way—by all available and knowledgeable staff members shifted to the problem—are designed to find the factors causing pear decline, as well as to eliminate those which are not.

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