meal, ground maize, screenings, molasses and kelp meal with guaranteed analysis of crude protein not less than 15%; Crude Fat not less than 2.5%; Crude Fiber not more than 9%; Nitrogen Free Extract 54%. All of these feeds have proved very satisfactory and a market has been established for the use of screenings as a dairy cattle mix. We find it difficult to maintain a guaranteed analysis on account of the variation in the analysis of screenings.

In several feed lots that were feeding hegari ensilage, cotton seed cake and meal, ground alfalfa, ground barley straw and barley, we could mix 1/3 ground screenings, ground alfalfa, ground barley straw and cotton seed meal in the feed with hegari ensilage and increase the amount fed from 15 to 20 pounds with an average increase in gain of .3 pounds per day. Reports coming back from the packing houses claim these cattle dress out above the average.

A GREENHOUSE METHOD FOR TESTING CURLY TOP RESISTANCE IN SUGAR BEETS

N. J. Giddings, Division of Sugar Plant Investigations, U. S. D. A.

Boxes 22½ inches long by 5½ inches wide and 4 3/4 or 6 3/4 inches deep were found desirable in testing the curly top resistance in sugar beets. Twelve plants per box were used in most tests. They were planted in pairs and the number of strains used in any trial was such that one strain did not always occur at the same position in the box.

Numerous curly top resistance tests gave very uniform and comparable results. The data were also found to agree with similar data secured in field trials. Reliable data were secured as to relative susceptibility to infection, period of incubation, resistance to injury, and death of diseased plants. The grouping of plants according to severity of symptoms gives important information as to degree of resistance which has been attained and uniformity of reaction among individual plants.

(Note: This subject is discussed in detail in Phytopathology Vol. 27, pp. 773-779, 1937.)

GREENHOUSE PURPOSES AND METHODS

F. V. Owen, U. S. D. A.

Greenhouse work in connection with a breeding program with sugar beets is believed valuable chiefly because of the greater intimacy which the investigator can have with his material. Speeding up the number of reproductive generations in a single year may also be important, but since this can be done by overwintering stecklings in the field it is too expensive to utilize for this purpose greenhouse space needed for more important work.

One of the greenhouse procedures which may be mentioned is the clonal

or vegetative propagation from single plants of special interest. By this method it has been possible to root and grow many plants of identical genetic constitution. Vigorous and succulent cuttings from branches of vegetative seedstalks are considered better than vegetative buds cut from the crowns of mother beets. Physiological considerations are particularly important, however, in connection with the successful production of these vegetative seedstalks. First, a vigorous seedstalk must be produced in a bolting environment, under a low temperature and long daily photoperiod, but before this seedstalk develops too far it must be thrown vegetative or semi-vegetative in a non-bolting environment, under a warm temperature and short daily photoperiod.

With cuttings of proper vigor and size, the problem of rooting them in a cutting bed is not different from the problem of rooting cuttings from many other species of plants familiar to horticulturists and gardeners. When these plants of identical genetic constitution are made available their usefulness in providing uniform genetic material for physiological and genetic problems is quite obvious. They can also be utilized in a practical plant-breeding program to excellent advantage.

GROWING OF SUGAR BEETS IN HILLS FREE FROM COMPETITION

S. B. Nuckols, U.S.D.A.

One of the difficulties, in selection of sugar beets for breeding purposes, is the obtaining of roots which have had equal growth conditions. Commercial sugar beets are normally grown in rows 20 inches apart and spread 12 inches within the rows. Very often missing hills occur which will give an advantage to beets adjacent to the missing spaces. For a number of years, the majority of the sugar beet selection work has been done by selecting beets which were completely surrounded by evenly spaced beets and attempting to avoid beets which were adjacent to missing hills. Such beets were termed normally competitive beets. Several investigators have not considered the normally competitive beet wholly accurate but it is a means of selecting beets more uniform than can be selected if no consideration is given to adjacent missing spaces in commercial plantings.

With small amounts of seed grown from isolated plants, it is sometimes, impossible to obtain a sufficient number of competitive beets, to judge accurately the value of the strain. This is due to the small amount of seed or poor germination which is often found in inbred or isolated plants.

In 1936, three men of the Office of Sugar Plants, each working separately in different field stations, attempted to grow some sugar beets free from competition so as to evaluate the productive ability of different strains of beets. S. B. Nuckols had, at this time, collected some data and prepared a manuscript which cast additional doubt upon the accuracy of the normal competitive beet method of selection. With slightly different purposes in view, the three men of this division, planted beets in hills and spaced them to a distance apart, which would either partly or totally eliminate the competitive effect of adjacent hills and also eliminate the loss of numerous plants which were previously discarded due to missing hills.