

side of it allows the air to circulate and prevents overheating. The asbestos is perforated for wiring, then slipped into place and the lamps are mounted upon it with the cords carried out behind as indicated.

The box shown in back view at the right (B) is made like the other except that in it there are three strips of asbestos with open spaces between them. Each strip is three inches wide and has one lamp mounted at the center of it. Several specimens may be lighted at one time by this box or six to eight lantern slides may be shown. A cheap support for the lantern slides can be made from a sheet of galvanized tin of the same size as the front of the box. When the windows are cut in this the tin at their upper and lower edges is folded back so as to make a groove. Above and below the openings in these grooves the slides may be moved and held in place. When finished the upper edge of the sheet is clipped to the top of the box for support. Exhibits intended to be at all permanent are improved by masks which conceal the extraneous accessories and extra light. Such masks are made of medium-weight black paper in which openings are easily cut. The paper is then lightly pasted to a sheet of window-glass a little larger than the front of the box against which it is supported. Labels receive light enough to be easily read if they are placed flat on the table in front of the openings in the mask.

ANN MORGAN

ZOOLOGY LABORATORY,
MOUNT HOLYOKE COLLEGE

CONTROLLING DAMPING-OFF WITH ELECTRIC LAMPS

THOSE who have had difficulty in growing seedlings because of the damping-off fungus during dull, moist weather may be interested in a simple method that has given complete control on pure lines of cucumber seedlings which are very susceptible to the fungus. Pure lines which have been weakened by selfing are slow to germinate during the autumn and winter months because the soil does not receive the sun's heat as it does during the summer. Also, old seed will not germinate well unless optimum conditions are supplied. Second generation seedlings which segregate for certain characters are worthless if damping-off takes the weaker ones.

Previously the soil has been sterilized by chemicals or heat, with varying degrees of success. Where seedlings are germinated every month this method becomes laborious, and considerable time must elapse before the seed can be planted. The sterilized soil becomes infested in a short time so that not more than two lots of seedlings can be grown for each sterilization.

A method has been in use whereby seed is germinated under 200-watt Mazda lamps suspended two feet above the seedlings. A dome reflector concentrates the light and heat so that two hundred seedlings can be grown under one lamp. A mixture of half sand and garden soil is used because it affords good drainage and reduces nitrification. This soil, without the lamps, controls the damping-off if sunlight is not reduced too much and the air does not remain too moist, but the lamps are needed after autumn begins. The seedlings become spindly if a rich garden soil is used.

The lamps are lighted as soon as the seed is planted and are not turned off except on bright sunny days. After the cotyledons have unfolded, the lights may be discontinued if the weather is bright and the surface soil is kept dry. It is preferable, however, to use the lamps until the seedlings are transplanted. With unfavorable growing conditions the potted plants may be exposed to the lamps several hours in the evening until the plants are large enough so that there is no further danger of damping-off.

The lamps have been used to advantage on selections that produce only pistillate flowers during the winter months. These selections may be selfed if the potted seedlings are exposed to the electric light until four or five true leaves are formed. Sufficient staminate flowers will be produced so that the first few pistillate flowers may be self-pollinated. An extra generation can thus be grown for those characters that are not influenced by environment.

Corn and lettuce grown by this method produce sufficient seed for an extra generation. The method has considerable application in northern latitudes where only the vegetative stage of adapted greenhouse plants can be grown during the winter months.

The advantages of the lamps, in addition to controlling damping-off, are that the soil is warmed so that weak or old seed germinates better in a shorter time, and the germinating can be done in a cool greenhouse without increasing the temperature of the greenhouse.

VICTOR A. TIEDJENS

MASSACHUSETTS AGRICULTURAL
EXPERIMENT STATION

SPECIAL ARTICLES

CINEMATOGRAPHS OF LIVING DEVELOPING RABBIT-EGGS¹

RABBITS' eggs of definite ages after mating; 21²/₃, 22, 23¹/₂, 67, 69 and 71 hours, were washed from

¹ The rabbits for these experiments were supplied by Professor W. E. Castle, of Harvard University.