added to the corn plants, in the current study, maintained the phytchrome in the far-red-absorbing form for a greater proportion of each day and thus delayed flowering.

The fewer mature kernels per ear from lighted plots (Table 2) resulted from kernels not being filled rather than not being present. Workers have inferred from McClelland’s report4 of lower grain yields by plants grown under extended day lengths, that fewer kernels were initiated. The opposite was true in the present study; more kernels were initiated and likely this was also the case in McClelland’s study. Unfertilized kernel initials at the tip end of ears tend to decompose as plants mature and are largely unnoticed at maturity. In the present study, apparently some of the kernels that appeared to be fertilized at the tip of ears on lighted plants failed to grow to mature kernels. These kernels would also tend to be unnoticed at maturity.

It has been generally found that the later corn is planted in the Corn Belt and adjoining areas, the lower the grain yields.8,9 The ear component data for the normally lighted plots of this experiment show some interesting relationships relative to yield of late-planted corn. The average number of kernels initiated per ear was 773, 883, and 831 for the April, May, and June plantings, respectively (Table 1). Accordingly it may be concluded that, insofar as yield relates to the number of kernels initiated per ear, differences in day length caused by different planting dates do not account for the lower yields of late-planted corn. In the current study, the poor yields of the corn planted late in the growing season were largely due to reduced weight per kernel, 0.330, 0.319, and 0.210 g for the April, May, and June plantings, respectively.

IMPROVED TECHNIQUE FOR INOCULATING STALK ROT IN CORN (Zea mays L.)

O. H. Calvert8 and M. S. Zuber8

MANY RESEARCH workers have reported the toothpick method of inoculating corn stalks with stalk-rotting fungi to be advantageous over most other methods (1). Young (3) listed these advantages: Uniform amount of inoculum; several sites can be inoculated with the same or different organisms at one time; the point of inoculation can be detected; the spread of the pathogen can be associated with the toothpick method is often encountered.

Horizontal and vertical rind splitting of the stalk often results when entrance holes for the toothpick are made with a sharp-pointed object such as an ice pick.

We have found a cordless4 electric drill very useful in making entrance holes for toothpicks, without checking or splitting the rind (Fig. 1). The drill is powered by a nickel cadmium battery housed in the handle. The battery is rechargeable overnight by the use of a small type B charger, using 115-volt alternating current. A fully charged battery will operate the drill from 8 to 10 hours.

The general procedure is for one man to operate the drill while a second man inserts the inoculum-laden toothpick. The size of the drill bit is slightly smaller than the diameter of the toothpick. The inserted toothpick must fit snugly in the stalk and thereby prevent drying of internal tissue and air contamination from other organisms. The round toothpicks, made of polished wood, are autoclaved in several changes of distilled water to remove resins before autoclaving again in 2 potato-dextrose broth for 1 hr. Boxes of 800 toothpicks are tied into 4 bundles with cotton string; placed in quart Mason jars with only the lower ends emersed in 50 ml of broth and re-autoclaved. Seeding is with a 5 mm diam. fungus mat of D. maydis, cut from a 10-day-old potato-dextrose agar Petri plate culture. The incubation time is 8 weeks. The inoculum-laden toothpicks are then dried and cut into short (ca. 20 mm) lengths and stored at room temperature.

By this method the only inoculum introduced into the stalk is that which is borne on the inserted toothpick. This method is an essential precaution in studies concerned with different isolates of an organism, or where inoculated stalks are used in stalk quality studies.

Literature Cited


* The Cordless® drill employed in this report is manufactured by Black and Decker Manufacturing Company, Towson, Maryland. Mention of this product and company does not imply endorsement or recommendation by the University of Missouri and USDA over others of a similar design not mentioned. * Registered Trademark.