

flowers, with the infected kernels at the base, failed to show anthesis. The degree of pollen sterility was correlated with the amount of infection of the ears. A test of pollen sterility was made using the technique discussed by us earlier (MGCNL 44:45, 1970). It was also found that during severe corn smut attacks even the original tassels of the plants failed to shed pollen and exhibited a high percentage of pollen sterility. Even failure of kernel formation was observed, probably owing to inadequate development of the embryo-sacs in the kernels.

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3. Formation of smut galls (*Ustilago maydis*) in normal and aborted kernels of maize.

It has been reported that certain smuts can produce chlamydo-spores on artificial culture media (Sartoris, Amer. Jour. Bot. 11:617, 1924; and Wang, Phytopath. 28:860, 1938). It was emphasized in these studies that chlamydospore development is accelerated on rich culture media over that on minimal media. This suggests that the fungus has a preference for concentration of nutrients in the culture media and matures more rapidly. But, in either case, no size or structural difference of chlamydospores was reported, when spores produced in vitro were compared with spores produced in host tissue. To demonstrate the nutrient preference of the fungus, corn smut (*Ustilago maydis*) was used in vivo. A few previously infected maize plants were chosen for this investigation. On each plant the second ear from the tassel was selected, because the first ear often exhibits delayed infection. At the time of pollination a limited quantity of pollen was applied to the protruding receptive stigmas of marked ears. Immediately after the ears were artificially pollinated, they were covered with paper bags to prevent further pollination. The kernels whose stigmas were not receptive at the time of pollination failed to produce a normal endosperm, due to lack of fertilization. Smut-galls appeared on the kernels of the marked ears. The ears were checked regularly to score the degree of infection. It was

found that in the host tissue corn smut has no preference for the nutrients (presence or absence of endosperm) in the normal or abortive kernels, and smut-galls are produced equally vigorously on both normal and aborted kernels.

Further, we have also observed that chlamyospores from infected kernels when transferred to a new host will produce only the kernel-galls in the next cycle of chlamyospore formation.

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4. Rootlessness, an unusual character found in some young seedlings of teosinte.

Normally, when teosinte seeds are exposed to optimum conditions of germination in the laboratory, germination begins by an orderly succession of developmental steps. The seed first imbibes water and swells and finally the coleorhiza (primary root) extends out from the root-pore (pulvinus notch) of the fruit-case and grows downward. A few hours later a coleoptile with embryonic leaves projects from the apical shoot-pore, following this the coleoptile ruptures and the young leaf expands. During this period a few secondary roots are formed which actually extend out from the shoot-pore. These secondary roots are not sensitive to gravity at first, but only gradually develop downward and become functional. When seeds are sown in the soil, the elongating embryonic leaves remain ensheathed in the coleoptile until they reach the soil surface. Occasionally, both the primary root and shoot emerge simultaneously from the seed-case and finally the seedlings become established. The germination pattern of teosinte seeds is very similar to that of maize.

In the present investigation we have studied variations in the germination pattern. The seeds of various documented teosinte races were allowed to germinate in laboratory conditions (at 24-25°C, room temp.). The seeds were first soaked in glass-distilled water for 3 hrs., then kept in paper cups with moist paper towels, covered with Saranwrap to retain moisture. The scoring for germination was done on the 9th and 11th days. Apart from the two normal germination patterns discussed above, two new types of seedlings with rootless character are recorded here. In the