Dual Purpose Corn Culture

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IN INDIA and certain other areas of the world a corn field is planted to produce both feed and food. In such dual-purpose systems heavy seeding rates are utilized and, as the corn grows, individual plants are continually removed at random for green livestock feed. The remaining plants are allowed to produce a grain crop. No references were found in American literature of how such dual-purpose systems compare with conventional corn culture.

There also is some scientific basis for studying such unorthodox planting systems. Watson showed that the low efficiency of the overall utilization of solar energy results in part from a long period following planting when crop leaves have not yet formed a canopy to intercept the incoming light. Much of this penetrates to the ground and the energy is lost in heating the soil or by evaporation of the soil moisture. Miller has shown that shading a corn plant during tasseling and silking drastically reduced yield, whereas moderate shade during early developmental stages in the plant’s life did not have a very detrimental effect on yield.

A hypothesis is therefore advanced that if a system which would absorb and utilize more of the total solar energy in the early growth stages should produce more total feed per acre. Removal of part of the competition for light at tasseling would allow extra light for the remaining plants during their reproductive stages. Thus, the growing of a dual-purpose corn crop—part to be harvested as forage and part left to yield a grain might provide a practical means of increasing the efficiency of use of the incoming solar energy.

A field experiment to test this hypothesis at DeKalb and Urbana, Ill., in 1960 and at the latter location in 1961. The practical adaptation of such a dual-purpose system to modern farm machinery led to the inclusion of several planting patterns. The effect of time of removal of the forage in such planting patterns was also investigated.

MATERIALS AND METHODS

Nine planting systems were compared, 1 of the regular corn planted in 40-inch rows to serve as a check. Figure 1 shows the individual plot layout for each planting system and harvest pattern. The horizontal lines indicate...