The Estimation of Yield of Corn of Standard Moisture Content in Hybrid Seed Corn Production

O. Kemphorne, J. L. Schmidt, and G. W. Snedecor

The purpose of the present paper is to present the results of an examination of data on moisture content of ear corn collected to verify relationships which have been used in the past to predict yield, and, if necessary, to establish more accurate relationships. The problem of estimating yield is common to all crops for which the moisture content of the crop varies at time of harvesting. Thus, in the case of cereals, particularly for corn, it is customary to report final yields on the basis of a standard moisture content.

Corn may be harvested when the moisture in the kernels ranges from below 15% up to 40%. Under particular circumstances it may be necessary to harvest the corn irrespective of its moisture content within the above range. The production of hybrid seed corn brought about the present investigation. In the production of hybrid seed corn it is a common practice for commercial firms to supply farmers with foundation seed and buy from them the hybrid seed at a previously agreed upon contract basis. The fact that this corn is being produced for seed necessitates that it must have a high germination. To ensure this, it must be harvested before heavy frosts. This however may result in the production of corn of high kernel moisture content at harvest time. The commercial firms and the producer usually agree that the basis of payment should be the basis of 15.5% of moisture in the grain. The problem is then to estimate for each producer's corn how much ear corn of a particular moisture content is required to give a bushel of shelled corn at 56 pounds per bushel with 15.5% moisture. Alternatively, it is required to estimate the number of bushels of corn of 15.5% moisture per 1,000 pounds of ear corn. The latter measure is the preferable one on statistical grounds, though in practice the two measures are easily interchanged since the latter is 1,000 divided by the former.

The number of bushels of 15.5% moisture per 1,000 pounds of ear corn, or the alternative measure, may be obtained directly by drying samples of known weight of ear corn in a drier until kernels contain 15.5% of moisture. The ears can then be shelled and the weight of grain obtained. This is not practicable, since it is difficult to dry samples so that the percentage of moisture in the kernels is exactly 15.5. The procedure is therefore to dry the ear corn until the moisture percentage is in the neighborhood of 15.5, weigh the kernels, then...