

Experimental Farms.

9. Vernon—Ladoga	Female with Early Sonora	Male.
10. Huron—Ladoga	do White Fife	do
11. Percy—Ladoga	do White Fife	do
12. Captor—Ladoga	do White Fife	do
13. Admiral—Campbell's White Chaff.	do Red Fife	do
14. Blenheim—Ladoga	do White Fife	do
15. Dufferin—Anglo-Canadian	do Indian Karachi	do

Of these results in cross-fertilizing seven are bearded varieties, and nine beardless. Seven of them were originated at the Central Farm by the Director—Nos. 1 and 2 in 1888; Nos. 6 and 9 in 1889; and Nos. 5, 13 and 15 in 1890. Seven were originated at the Central Farm by Dr. A. P. Saunders—Nos. 3, 7, 8, 10, 11, 12 and 14, all in 1888, and one by Mr. J. L. McMurray of the Experimental Farm staff, No. 4, at the Central Farm in 1890. The chief purposes in view in this work of cross-breeding were to add to the number of vigorous and productive sorts, and to produce early ripening varieties of high quality. In most of these crosses Red Fife or White Fife have been used as a basis for quality, vigour and productiveness, and Ladoga, Early Sonora, Indian Karachi, and No. 1 Club Bombay for earliness in ripening.

HOW VARIETIES OF CROSS-BRED AND HYBRID GRAIN ARE PRODUCED.

The production of new varieties of grain by cross-fertilizing and hybridizing is one of the most interesting and important branches of work carried on at the Experimental Farms.

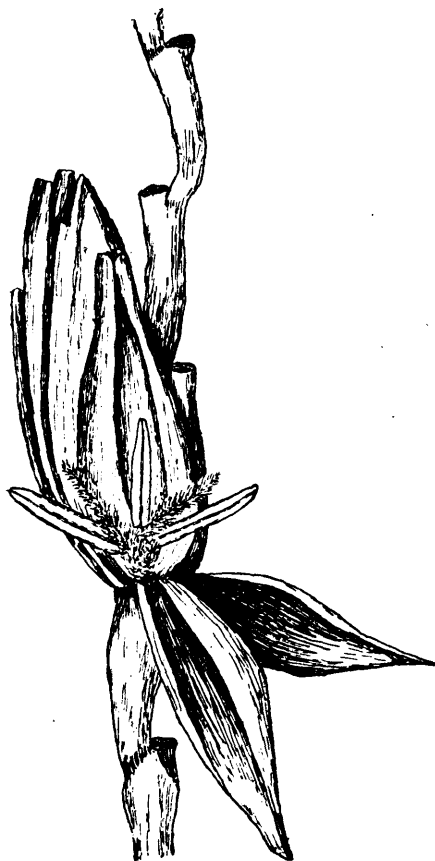


Fig. 7.

The term cross-bred is used when referring to the crosses produced between different varieties of the same species, and the word hybrid when referring to new forms produced by crossing plants which are classed by botanists as distinct species, such as two-rowed and six-rowed barley. The manner in which a cross is effected is as follows: Suppose the experiment to be carried on with wheat, an ear is selected soon after it has shot out from the sheath. This ear consists of a series of clusters called spikelets, which are arranged alternately on opposite sides of the stalk of straw; later, each spikelet, if well filled, will contain from three to five kernels of wheat, at present the kernels are not formed and the hollow centres which they are destined to fill are now occupied with the flowers of the grain. In Fig. 7 we have a portion of such a wheat ear with all the spikelets but one removed, and from one side of this in which is one of the floral chambers, the double sheathing of chaff—known as the glumes—have been turned down, and the flower of the wheat is exposed to view. In this figure, also in that which follows, the parts are magnified exactly four times the natural size. These were drawn from nature by Dr. C. E. Saunders. The flower is seen to consist of three stamens which are thread-like at the base and developed into an elongated sac above, called an anther which contains the fertilizing pollen, and a double branched feathery pistil. The stamens are spoken of as the male organs,