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SPECIAL ARTICLES

A NEW VARIETY OF BARLEY WITH STRIKING CHARACTERISTICS

THE new variety of barley, which the writer has provisionally called Mack's Branched barley, has never been recorded in literature heretofore. It was discovered by Mr. J. M. Mack, of Fallbrook, California, in a wheat field mixed with much barley. Specimens of the new form were sent to the University of California in 1921 for further investigation; and the writer has been much interested in it in connection with his genetic studies in barley. It is a six row barley possessing the following characteristics:

1. An Increase in the Number of Nodes accompanied by an irregular Shortening of Internodes. The number of nodes in ordinary varieties of barley varies from three to seven, the uppermost internode below the spike being always the longest; while Mack's Branched barley has from 10 to 30 nodes on each tiller without elongation of the uppermost internode. The shortening of the internodes and the increase in the number of nodes make the straw much stiffer; and indeed the variety would be most resistant to lodging if not for the fact that too heavy a weight is carried at the upper portion as a result of branching.

2. The capacity to Branch at Any Node. Tillers arise from the first node at the bottom in ordinary cultivated barleys. Wessling barley has a branched spike, but the branching is confined to the head. No form has been recorded heretofore as branching freely at any node and also capable of secondary and tertiary branching, which is a characteristic of Mack's Branched barley.

3. The capacity to Produce Roots at any Node. Although it is possible to induce some of the common varieties of barley to produce roots at nodes near the base, the setting of

roots at the upper nodes when covered with soil is quite a unique character possessed by this form alone.

4. The Capability of Vegetative Propagation. The fact that this variety of barley is capable of branching and rooting at every node suggested to the writer the possibility of vegetative propagation. Abundant roots were secured by the layerage method in a period of 2 weeks in the open field in January. Cutting off a tiller and transplanting it in a pot in the greenhouse has resulted in slower recovery than in the case of mount layerage; but nevertheless a main root has arisen from a node near the place of cutting and hence it is reasonably sure that the cutting will succeed as a separate plant.

The possibility of vegetative propagation of this cereal is of considerable scientific interest, if it is not yet of practical agricultural interest. This new form is of appreciable value especially to those interested in genetic studies of barley, because it makes possible the continuous propagation of the heterozygote. This will make backcrossing in barley as a means of genetic investigation more practical, although it is still doubtful whether backcrossing can be extensively employed in this cereal, the process of artificial fertilization being so tedious in contrast with the ease of growing self-fertilizing hybrid generations.

Although the new form is apparently of no agricultural value by itself, yet the branching and cold resistant characters may be utilized to advantage by hybridization with some of the commoner types of cultivated barley.

Nothing is yet known concerning the origin of this interesting form, as it was discovered in a mixed field. All that we know is that its striking characteristics are constant and breed true under the different environmental conditions to which it has been subjected. The writer plans to make a number of crosses between this form and several of the cultivated varieties in the coming spring, as this interesting barley certainly deserves an intensive genetic study.

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¹ *Phil. Mag.*, s. 5, Vol. 24, p. 87.

² *Phil. Mag.*, s. 5, Vol. 24, p. 423.