GRANTHAM: TILLERING OF WINTER WHEATS.

TILLERING AS A FACTOR IN DETERMINING THE DESIRABLE QUALITIES OF WINTER WHEATS.

A. E. GRANTHAM,

Delaware Experiment Station, Newark, Del.

Submitted for publication in December, 1912.

It is a matter of common observation that the wheat plant, if given space and a good soil, will produce a number of culms or stalks from each seed. Whether or not this habit of the wheat plant is an index to other desirable qualities, is a question not fully settled. The data gathered in our work at the Delaware Station seem to indicate that tillering may be looked upon as an expression of certain characteristics of the plant which are associated or correlated with desirable qualities. The wheat plant responds to favorable environment by increasing the number of culms rather than by lengthening the culm or spike or by increasing the number of grains in the spike. That is, the individual plant, if given the opportunity of development, will throw its energies more largely towards increasing the number of culms than to the corresponding increase in size of other parts. For example, the number of culms may be increased from 2 or 3 per plant to 8 or 12, while the length of culm or length of spike would be increased by only a fraction of their length over the corresponding measurements of the plant with the fewer tillers. Thus it would appear that the qualities of resistance and of response to various soil conditions are more clearly expressed by the tendency of a variety to tiller than by the changes in the other physical characters of the plant. The capacity of a variety to do well under varying conditions, is undoubtedly a desirable characteristic. If one variety of wheat will produce better than others on a poor soil or during an unfavorable season, the fact is of value to the grower.

In order to study the habit of tillering in wheats, it is necessary to sow the grain in such a manner that an examination of the individual plant may be made. As ordinarily sown with the drill under field conditions, the plants are so crowded that it is impossible to determine the exact number of culms from each seed. Furthermore, since varieties of wheat differ so widely in the size of kernels, it is quite impossible to get the same number of plants of each variety on a given area. To get a good idea of the behavior of a variety, it is obvious that an intimate study must be made of the individual plants or units of which it is composed. For this reason we have supplemented our wheat variety tests under ordinary field conditions by growing the