THE CREATION AND MAINTENANCE OF TWO SPRING BARLEY VARIETIES

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1. INTRODUCTION

In the literature on new varieties little information is given on details in regard to methods of selection used in hybrid populations, nor are data mentioned about the building up of young varieties in their stages of official evaluation. Undoubtedly there is a great variation in this respect, so that it seems worth while to publish on the subject.

In this article we describe the procedures followed in the development of the Dutch spring barleys Minerva and Vada. The report is illustrated by surveys representing the procedure of selection.

2. THE BREEDING OF THE SPRING BARLEYS MINERVA AND VADA

The Institute of Agricultural Plant Breeding (I.v.P.) at Wageningen maintains a collection of varieties of cereals for breeding purposes. Annually varieties are tested under conditions prevailing in the Netherlands. When setting up a breeding programme the initial material is chosen from this collection.

For instance a cross was made between Hordeum laevigatum and Goudgerst (Svallov's Gold barley) at the I.v.P. in 1928. Hordeum laevigatum is a botanical species with no conspicuously good features, its straw stiffness and yield being insufficient. However, our attention was drawn by its good resistance to mildew.

At the time Goudgerst was the most important spring barley variety in the Netherlands and covered more than 80% of the area under barley. It was fairly short but, in comparison with the then grown varieties, it had fairly stiff straw and a great tillering capacity. It ranked amongst the most productive varieties but was heavily attacked by yellow rust in some years.

When the above hybrid population had segregated to some extent, ears were chosen from the F_6 in 1935. In following years also lines were selected from the offspring. Yields were always unsatisfactory, however.

The Dutch breeders received material from the population and a selection was submitted to evaluation. It never reached the List, however, on account of its poor production and susceptibility to rust.

After the Second World War cereal breeding and more particularly barley breeding were tackled on a larger scale. In 1947 and 1949 hundreds of seeds from the hybrid population Hordeum laevigatum × Goudgerst were sown.

In the material sown on fertile soil various lines came to the fore which were conspicuous in straw stiffness and mildew resistance.

In 1950, two selections excelled in tillering capacity, bearing a large number of stems
per plant. They outyielded the standard variety by more than 15%. This induced us to pay special attention to these lines.

However, one should guard against drawing conclusions from yield-figures of one year. Many selections mostly fall short of expectations in later trials and are soon discarded. When the same line dominates in yield every year it may be assumed that it has a favourable genetical constitution and the chosen line can be entered into the Central Register of Varieties and released for further trials. Then comes the problem of producing a sufficient quantity of seed for sowing on the trial fields and for multiplication. For this purpose we drilled the seeds at distances of 25 × 25 cm on a field of 50 m². The plants tillered heavily and produced 20–30 ears. A yield of 35 kg was more than sufficient to supply seed for trial fields.

After testing in the I.V.R.O. observation trial fields in 1952 and in the trial farm series in 1953 it soon appeared that the two selections indicated by P.B. 26 and L.G. 51 were among the most productive lines. L.G.51 was placed on the List of Varieties in 1955 under the name of Minerva and P.B.26 in 1956 under the name of Vada.

Both varieties are distinct by their slow development in spring. Farmers sometimes consider this property an unfavourable one, but it is striking that some of the most productive foreign varieties which have been introduced in the Netherlands of late years show the same tendency.

Apparently in other countries it is also a well-known fact that a rapid development in spring is accompanied by a lower number of sprouts and stems. “The plants should have time enough to develop a fair number of tillers.” A bad tiller-development is a very unfavourable feature, especially in the case of spring barley.

Determination of the 1000-kernel weight and a keen selection for ear-length and number of kernels are also very important.

We regretted to learn that the Nacobrouw (National Committee of Malting Barley) confirmed our surmise that the two new I.v.P.-varieties are not fit for malting purposes. On the other hand they are very suitable for pearled barley, on account of their big kernels. In the trials they proved to rank among the most productive varieties. Vada gave the highest yield on the south-western, the central and the river clay trial fields both in 1955 and in 1956 (See tables 1 and 2).

**Table 1. Survey of the relative production on the I.V.R.O. spring barley trial fields in 1955**

<table>
<thead>
<tr>
<th>The Netherlands</th>
<th>Production (average of region) kg/are</th>
<th>Balder</th>
<th>Pinoline</th>
<th>Herta</th>
<th>Carlsberg</th>
<th>Proctor</th>
<th>Minerva</th>
<th>Vada</th>
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<tr>
<td>Northern marine clay...</td>
<td>48.3</td>
<td></td>
<td>94</td>
<td>104</td>
<td>104</td>
<td>-</td>
<td>103</td>
<td>106</td>
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<tr>
<td>Central marine clay....</td>
<td>52.7</td>
<td>100</td>
<td>97</td>
<td>101</td>
<td>103</td>
<td>105</td>
<td>104</td>
<td>109</td>
</tr>
<tr>
<td>South-western marine clay</td>
<td>47.7</td>
<td>99</td>
<td>104</td>
<td>102</td>
<td>105</td>
<td>104</td>
<td>102</td>
<td>108</td>
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<tr>
<td>River clay</td>
<td>45.2</td>
<td>98</td>
<td>102</td>
<td>102</td>
<td>97</td>
<td>-</td>
<td>106</td>
<td>105</td>
</tr>
<tr>
<td>Loess</td>
<td>42.6</td>
<td></td>
<td>91</td>
<td>107</td>
<td>-</td>
<td>-</td>
<td>99</td>
<td>114</td>
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