FACTORS INFLUENCING THE BREEDING OF AGRICULTURAL CROPS IN THE NETHERLANDS

H. DE HAAN
Institute of Agricultural Plant Breeding, Wageningen

Received 19 October 1959

ABSTRACT

The writer draws attention to some factors influencing the breeding of agricultural crops in the Netherlands. The mutual influence of breeding new varieties, research on varieties, seed production, agricultural production and export is explained.

In the Netherlands, farmers on average purchase approved seed potatoes once in three years, which equals the frequency of replacement of the seed of rye. On the area covered by wheat five-eighths is sown with approved seed and of peas and oats, one-half. In the case of sugar beet, fodder beet and some other crops (including vegetables) 100% original seed is used.

The writer draws attention in particular to the reasons why there is a continuous need for new seed and seed potatoes. As causes are mentioned: 1. the fact that a farmer did not grow a particular crop in the previous year; 2. that he had difficulties with the seed production of a given variety or the variety deteriorated owing to impurity, diseases or admixtures; 3. the wish to choose a new variety of better yielding capacity or other favourable properties; 4. purchase of original seed of a variety in demand for increase to once grown original seed or purchase of first rate starting material from the clonal selection farms for growing seed potatoes of a variety in demand.

INTRODUCTION

There exists a connection between the two aspects of plant breeding, scientific research on the one side and the breeding of new varieties on the other.

Research in plant breeding has resulted in the selection of parent plants and in the development of new methods in the breeding of new varieties. Numerous problems involved in practical applications have been tackled by research workers.

Research in plant breeding has opened up new possibilities, while breeders have shown themselves to be capable of using them to advantage. The development of improved varieties influences the choice of varieties grown for consumption and this,
in turn, affects the choice of varieties for seed production to satisfy the demands for propagating material.

Production in agriculture has become more and more canalized in the course of years, some procedures used originally in mixed farming have since become specialized. In former days it was hardly possible to speak of seed production. In that time it was often customary to purchase new seed; however, judged according to the present standards this propagating material can be best compared with the present harvest for consumption when it is grown under favourable conditions. It was more and more realized that seeds can be of extremely different quality. This and the fact that more money was paid for this better quality has induced many farmers to specialize in this field so that it developed into a separate branch of agriculture in the Netherlands and in several other countries. In the case of seed potatoes this specialization even went as far as the development of clonal selection farms out of the numerous seed potato selection farms.

It is a cogent argument for the organizing power of the farmers organizations and the seed merchants in the Netherlands that a sound system of crop inspection has developed.

Since 1942 all seed and seed potatoes to be introduced into the trade have to be approved. Seed which has not been inspected in the field and also after harvesting is destined for consumption (in the Netherlands or in foreign countries), with the exception of a small part of the harvest which is being sown or planted in the farmer's own fields. Dutch farmers only exceptionally use more often grown seed than the 3rd and 4th generation. Replacement of seed by purchasing approved propagating material has now become the rule.

The great significance of breeding research, the breeding of new varieties and seed production is generally recognized; however, one important point is often taken for granted. Here I have in mind the continuous need for new propagating material in agriculture which in a sense paves the way for new varieties. Conversely plant breeding, by the replacement of propagating material, offers the opportunity of choosing a better variety.

FACTORS INFLUENCING THE BREEDING OF AGRICULTURAL CROPS IN THE NETHERLANDS

The "spheres of influence" affecting the breeding of agricultural crops can be represented diagrammatically (fig. 1). In this diagram plant breeding has been placed in the centre, comprising on the one side the breeding research, on the other the developing of new varieties. The influence of other branches of science affecting research in plant breeding has been indicated by means of arrows directed reciprocally.

Breeding research on agricultural crops

The way in which breeding research on agricultural crops has been organized in the Netherlands was described by PROF. DR. J. C. DORST (2).

Developing new varieties of agricultural crops

Breeding work in the Netherlands is almost exclusively carried out by private and cooperative breeding establishments. Seven of the 375 Dutch varieties placed on the