# DEVELOPMENTS IN BREEDING AND PROPAGATION DUE TO SOCIO-ECONOMIC FACTORS

**L.G.J. van Horen**

Agricultural Economics Research Institute

P.O. Box 29703

NL-2502 LS The Hague, Netherlands



## ABSTRACT

*Total production value for seeds and propagation material in the Netherlands in 1994 equals 640 million Euro, approximately 6% of world production value. The organisation of the industry is continuously changing. To predict developments in this industry, we performed desk-research and asked managers about their response on the development of important socio-economic factors: With these developments in mind, companies have to develop a global strategy:*

*Shareholders value is related to availability of patents, access to genetic sources and efficiency in which markets can be opened up and maintained. Besides this strategy the following will occur.*

- *Economies of scale are important. Mergers or buy-outs will continuously occur. Local activities will be managed from a headquarter, located in the USA, Europe or Japan.*
- *Chain management becomes more important. Guarantee- or certification-systems will be introduced. Seed business companies claim a good performance of their varieties to production, processing and environment.*
- *R&D is not restricted to national borders.*
- *Economic arguments, climate conditions and regional logistic possibilities will decide on the location of breeding and propagating activities.*



## INTRODUCTION

The breeding and propagation industry supplies agriculture with high value propagation materials like seeds, seed-potatoes, bulbs, cuttings, young plants and

tissue culture materials. Activities in those companies are basic research, applied research, breeding, propagation, services, marketing, sales and distribution.

Socio-economic developments have consequences for the management of these companies. On behalf of the Ministry of Agriculture, Nature management and Fisheries in the Netherlands, we conducted a study on the development of the seed industry in the next decade.

## METHOD

1. First we describe the industry in the Netherlands. We look upon the different activities in the industry and to the different companies involved in these activities for four subsectors: potatoes, crops for arable farming and grasses, vegetables and flowers.
2. Secondly we describe important socio-economic factors.
3. These two activities result in a picture describing the development in the total breeding and propagation industry in the Netherlands in the next ten years and in the four different subsectors we look upon.
4. Some of the predicted developments depend on preconditions. Government or the industry has to act to fulfill these conditions for a further development of the industry.

## RESULTS

### Structure of the industry

Supplying agriculture with high value propagation material consists of six different activities (Hietbrink et al., 1997 and Zuurbier & Migchels, 1994).

1. Collecting and conditioning of genetic material;
   The first activity is the collecting and conditioning of genetic material or the guarantee to get entrance to genetic sources. In the Netherlands as well private and public organisations are collecting genetic material. An important organisation is the Centre for Genetic Sources (CGN).

2. Research & development;

   Universities, institutions and private companies try to develop new techniques for acceleration or improvement of the breeding process.

3. Breeding;

   In applied breeding research, these new techniques, together with conventional methods, are used to develop new varieties of different crops for arable farming or horticulture.

4. Services;

   Some functions in the sector like seed technology, in vitro propagation (tissue culture), advisory or licence services are concentrated in specialized firms.

5. Propagation;

   The next stage is propagation of material by seeds, cuttings, bulbs or tissue culture to get enough plant material or young plants for the primary sector.

6. Marketing, sales and logistics;

   At the end, or in the beginning as you wish, the marketing, sales and logistics departments of the companies trying to emphasize the advantages of their varieties to the farmers.

The schedule shows the organisation of the breeding industry in the Netherlands.

*Organisation of the breeding and propagation industry in the Netherlands*

| Crops<br>Process | Potatoes | Crops for arable farming, grasses | Vegetables | Flowers |
|---|---|---|---|---|
| Genetic sources | Wageningen University and Research Centre, Centre for Genetic Sources (CGN), botanical gardens, breeding companies, private collecting | | | |
| Research and development | Wageningen University and Research Centre, other universities, life science companies, biotechnology companies, breeding companies | | | |
| Breeding | 6 breeding companies, 200 private breeders | 15 breeding companies | 25 breeding companies | 50 breeding companies |
| Services | Seedcoating, 67 laboratoria for in vitro propagation (29 > 100.000 pieces), advisory, licence bureaus | | | |
| Propagation | Seed potato farmers | grass seed growers, other seed growers | Vegetable seed growers, suppliers of young plants | Flower seed growers, suppliers of young plants and seedlings |
| Marketing, sales & logistics | 6 large trade companies | Marketing and sales departments of breeding companies, agents, licences etc.etc. | | |

Total production value for seeds and propagation material in the Netherlands in 1994 equals 640 million Euro, approximately 6% of world production value (Heybroek, 1996).

**Socio-economic developments**

Second part of our study were interviews with managers in the industry. We asked them to react on a selection of important socio-economic developments.

*Liberalisation of world trade*

The trend is a globalisation of world trade. However, some protectionism will always occur. Large companies will benefit from enlargement of new markets like Eastern Europe, South-east Asia and South-America. Signing of the UPOV (International Union for the Protection of new Varieties of Plants) is an important precondition of starting activities in some countries.

*Enlargement of home markets*

For Dutch companies, Europe is becoming the home market. Introduction of the Euro-currency and the enlargement of the European Union will make business easier. This (critical) home market stimulates to find new innovations and develop quality-guarantee or certification-systems.

*Greater influence of consumers*

Consumers demand safe food and a safe production of food. In the developed countries, the consumer demands for agricultural products diverge more and more. The consequence will be a demand for more varieties. A good public relations policy is needed. Breeding companies have to combine consumer and production demands.

*Consumption pattern*

In some developing countries in Asia, South-America and Eastern Europe consumers will reach a higher degree of prosperity. The consumption pattern will change when consumers can spend more on agricultural products. Niche-marketing in these countries becomes more important. The market will change in the next years from a sellers'market to a buyers'market.

*Ethics*

The society will accept genetic modified products if the advantages of genetic modification are clear to consumers. Due to the international character of the industry and the liberalisation of trade, the influence of non-gouvernemental organisations will emphasize on regulation of production of genetic modified products.

*Biodiversity*

Political and public attention to biodiversity is growing. Biodiversity seems to be a precondition for agrobiodiversity c.q. the genetic variation in crops for arable farming and horticulture. To ensure biodiversity, the entry to natural genetic sources will be limited. These entries to genetic sources for breeding companies, therefore are becoming more important, so companies have to guarantee there admittance.

*Environment*

The government will set preconditions to the production of agricultural products to diminish environmental pollution. This will stimulate innovations in propagation material focused on growing characteristics.

*Science and research*

Protection of research results becomes more and more important. Companies will exchange their patents or plant breeding rights with each other. The government will concentrate their financial means on basic research. The competitiveness of companies is being influenced by the control of patents and the effectiveness of using these. Also it will stimulate joint-ventures and other means of cooperation or mergers and buy-outs.

*Infrastructure*

For competitiveness of the company, a good infrastructure (entrance to capital, labour and education, research, and an optimum use of technology and telecommunication) is essential (Kleijn et al, 1992). For each activity, management has to look at the best possible location (costs, climate (risks)). If these activities will

be set up in different parts of the world, a good communication infrastructure in the headquarters site is indispensible.

*Government*

In the Netherlands, government is withdrawing its activities in breeding and propagation industry. Secondly, Dutch government policy is more and more influenced by the European Union. And thirdly, these government decisions on activities in breeding and propagation will be taken over by public and private institutions.

**Activities in the future**

With the described developments and structure of the industry in mind we can try to paint a picture of the activities in the future.

*General*

The home market for Dutch companies is enlarged to Europe. The sales and logistic activities to other markets are intensified. Breeding companies will have to choose either for a broad spectrum of propagation materials or become a very specialized supplier. Genetic modified varieties are accepted by the public.

Shareholders value of a company, is set by the availability for new techniques (patents) and genetic sources and by its effectiveness to get into new markets.

A lot of small breeding companies will be merged by large companies due to economies of scale in basic research and logistics. Some of thes large companies will have their headquarter in the Netherlands due to a good infrastructure. The location of other activities is the result of a permanent economic consideration. Each activity can take place in another part of the world.

Large companies will carry out there basic research all over the world, often close to important research centres in the world. Sometimes basic research is carried out in their own laboratories, sometimes in cooperation with universities or research organisations.

Breeding stations will look upon climatic conditions similar to those of their growers.

Propagation of seeds (or unrooted cuttings) can take place all over the world.

Propagation of young plants will be done close to the growing places. Distribution and logistics will take place in countries with a good infrastructure.

Let us have a look on the subsectors we described.

*Seed potatoes*

Dutch companies will still be the main suppliers for seed potatoes. The market for seed potatoes is stable. The number of breeders will further decrease. Genetic modified products will find their way to the majority of the consumers.

*Arable crops, grasses*

Breeding companies for arable crops and grasses are global players with their headquarters all over the world but especially in the United States and France. Genetic modified products will more and more become familiar.

*Horticulture, floriculture*

For seeds, headquarters of breeding companies are all over the world (USA, Japan, Europe). The propagation could be anywhere (cost-based), the sales and distribution will be still very important in the Netherlands.

Breeding of vegetables or flowers with less economic importance worldwide will still be very important in the Netherlands. These firms are very specialized propagation companies, close to growers. Economies of scale are important.

**Preconditions for development**

Like described before, there are some preconditions for the predicted developments.

1. Acceptance for genetic modified products; The breeding industry has to set up a communication strategy for the discussion about genetic modified products.
2. Possibility for protection of research results (UPOV, patents); Breeding companies will invest in basic research if they can protect the results against other companies.
3. Diminishing legal barrieres for trade and distribution to implement a global strategy;
4. Infrastructure (research, traffic, informationtechnology, telecommunication);
5. Entrance to genetic sources.

## CONCLUSIONS

In this paper a description is given about the strategy of the Dutch breeding and propagation industry on socio-economic developments. Companies in this industry are or are becoming global players with activities all over the world. If a country wants to benefit it has to cooperate with these firms to realize the preconditions.

## LITERATURE


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