

**Behind the registered trademark
Foxtrot® lies a good idea which was
realized through project work that made
Cheminova able to market the herbicide
fenoxaprop for use in cereals 5 years
ahead of others. The chemical element of
the idea is today produced at our factory
in Denmark.**

It takes something special to make herbicides against grass weeds work in cereals which also belong to the grass family. Many herbicides have the potential of harming the cereal crops when grass weeds are controlled. So it is for the fenoxaprop, too - the active ingredient in Foxtrot, fenoxaprop, can only be used in wheat under very good conditions and there is still a risk that the crop may be damaged. In barley, it cannot be used at all.

FOXTROT -

By Lars-Erik Kruse Pedersen

SAFENER TECHNOLOGY

The problem is solved by adding a so-called safener to the product. The safener is a chemical compound that increases the ability of the crop to break down herbicides before they do harm. The safener increases the enzyme activity of the crop plants and makes the product fit for use in both wheat and barley. With safener you have an intelligent herbicide which knows the difference between friend and enemy even if they belong to the same botanical family. This technology has made fenoxaprop safe for use in cereal crops.

PATENT PROTECTION

Relatively few safeners are available and some have been discovered after fenoxaprop was launched by Aventis in

From laboratory and greenhouse to agricultural use



HARALD TEICHER, PROJECT MANAGER IN THE EARLY DEVELOPMENT PHASE OF THE PROJECT, EMPHASIZES:

- Developing the right formulation has been very challenging. Especially, the proportion between the active ingredient and the safener has been examined carefully as barley and wheat contain different quantities of the enzyme which is activated by the safener. Based on many experiments and tests, both in the laboratory, in the greenhouse and in the field, we found an optimum combination which secures that the safener is active under all relevant climatic conditions. The formulation is based on water as solvent, Harald Teicher adds.



CAMILLA MØLLER, AGRONOMIST, TECHNICAL MANAGER FOR HERBICIDES, EXPLAINS:

- Before we send a new product on the market it is necessary that all registration tests are made with a satisfactory result. But when it came to Foxtrot where a new combination of safener and active ingredient was to be tested, the demands to the field trials were very high. In return we have proven the effect, even in barley which in this connection is the most difficult crop, says Camilla and draws the attention to the excitement in cracking this hard agrochemical nut. - The comprehensive tests in relevant varieties and under different climatic conditions support that Foxtrot is a very robust product.

MORE THAN A DANCE



Photo: Cheminova

1982. The mixture of fenoxaprop and safener was marketed in 1988 and was patented by this company - even twice, as the first safener was replaced by a new and improved product in 1996. In that way, Aventis' monopoly of the product was extended for 10 years. Although the patent of the active ingredient fenoxaprop has expired, other producers have not been able to access the market because a safener is needed. The old safener can no longer be environmentally approved and the new one is covered by patents until 2010.

THE GOOD IDEA

Fenoxaprop was an interesting product for Cheminova as we at an early stage saw good opportunities in herbicides for grain which could become a new important area for Cheminova. With the patent expiring, several good products are becoming accessible to Cheminova, and fenoxaprop could be one of the first if we could just get around the safener patents. New thinking was required.

- As almost all other discoveries in the world, our idea was actually quite simple, admits Henrik Schlosser who was prime mover behind the idea. - What we found out was simply that another safener, which is used by Syngenta for quite another product, could be used together

with fenoxaprop. This combination had not been marketed and the patent was to expire as early as in 2005. Nobody else had discovered this possibility. Here was an opportunity to get early access to the market if only the idea could work in practice, and it did, Henrik Schlosser says.

FIRM GRIP ON THE MARKET ALREADY

Today, sales of Foxtrot are increasing and there are still very large potential markets to explore. The latest steps forward are approval and sales in Denmark.

The chemistry behind the safener was new to Cheminova



Photo: Henrik V. Krogh

- Considerations about buying the safener, having it toll produced in China or producing it at Cheminova India facilities were in the picture at the very beginning. However, it ended up with production in Denmark, says Steen Hjuvler Nielsen who as a synthesis chemist was responsible for the development of the synthesis. - It was a challenge in line with all other new syntheses where the work in the laboratory includes ups and downs. The further development took place in cooperation with the pilot plant which has the assignment to transform the chemical process to a larger scale production.