

Modern rapeseed breeding is focused on the variety and its yield

Improvements in the classical plant breeding and the rapeseed breeding progress

The classical rapeseed breeding is completed by modern methods

The breeding of oilseed rape is still largely done using classical techniques and as breeding technologies improve, new methods have been incorporated into this process. Biotechnological methods for example, with microspores and double haploids have shortened the breeding process by many years. Work that was earlier carried out on the field can be now completed in greenhouses and laboratories. Through this advancement it is possible to produce more than one generation per year and speed up the development of varieties with desired market traits e.g. high oil content and improved Stem Canker tolerance. The demands of the market change extremely quickly and therefore, we require breeding techniques that have a quicker turnaround time. With the use of modern technologies you can nearly predict the result of a cross between two different oilseed rape plants. This reduces the lengthy, time intensive and expensive test-cross-breeding in the field. The classical selection-breeding is still done in the field and is essential for testing the practical suitability of the varieties in a "real life" situation.



The breeding progress gets clear

Oilseed rape breeding from the Rapool-partners is focused on three targets: Yield, Quality and Resistance. There is no other plant where the breeding on yield and quality is more successful than by oilseed rape. The breeding of oilseed rape has a long tradition and has made the oilseed rape plant into an important agricultural cultivar.

The adjustment to 0- or rather 00-oilseed rape enabled the oil and meal to be used for a wide range of purposes. Erucic acid from rapeseed played a secondary role worldwide but has turned into an important component for the production of detergents. The cultivation of the new 'quality oilseed rape' e.g. high oleic/low linolenic acid (HOLLi) increased to nearly 1 million hectares and an estimated annual increase of up to 10% is expected. The biggest customers of rapeseed oil are the biodiesel-industry and the fat chemistry. Rapeseed oil is a liquid, can be pumped and measured out, is storable and has got a high energy content. With these qualities it possesses the ideal requirements for the in energy industries and the mobile world in which we now live in.

For the breeders in the Rapool-Ring the varieties and yield are the center of the attention. Developments in the hybrid seed production process are fully optimized and yield increase by fertilisation and pest control can't be expected in countries like Germany due to the environmental consciousness of the public. Yield increases must be achieved by improved genetics and therefore a large emphasis is placed on plant breeding.

Varieties and seed treatment promises for some big progress in the future and are distinctively obtainable in certified seeds. The production of certified seed is expensive and time consuming; therefore the sales of certified seed are important because a large proportion of the turnover is reinvested into breeding programs and development. This breeding intensity must be maintained to insure the long-term competitiveness of European farmers.

Hybrids - the future of the oilseed rape breeding

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The Rapool-plant breeders' efforts are exclusively concentrated on oilseed rape. The specialists of this crop manage together three winter oilseed rape breeding programs. With an important market share, the Rapool varieties lead the market and cover a large percentage of the landscape. Open pollinated varieties, MSL hybrids, OGURA hybrids, high erucic acid rapeseed, high oleic acid / low linoleic acid rapeseed or special varieties with pathogen resistance, for example Plamodiophora resistance (Clubroot resistant variety – Mendel) are part of the extensive range of varieties. In the future Rapool-Ring will concentrate on the production of hybrid varieties for all quality segments in the market. Open pollinated varieties won't have the yield potential long-term and will be thing of the past. With the third generation of hybrids now on the market the yield of open pollinated varieties are not on the same level as hybrids. In stressful climatic conditions i.e. drought, the heterosis effect can be clearly observed. Hybrid oilseed rape plants stand out because they can be sown later, show better disease resistance, and have enormous vitality and compensation ability. These points help to secure stable and consistent yields for the farmer.



In the years to come oilseed rape breeding will produce new efficient hybrid varieties with high stable yields combined with very high oil contents. Improvements will also be made, using new gene pools, in the resistance against Clubroot (*Plamodiophora brassicae*) which will replace Mendel. Further advancements have been made with the inclusion of the RLM 7 gene against Phoma. Varieties with Verticillium tolerances are on the way. Early sowing and varieties with stable pods will increase the sowing and harvest window. The breeders will further focus on N-efficiency and drought tolerance.

There will be improvements in special qualities such as Erucic acid and HOLLI through the breeding of new hybrids. New 'short' hybrids with high yield potential are registered and in the next few years will compliment other varieties available. Varieties with herbicide resistance (Clearfield) are developed, which are based on classical breeding-methods, selected conventionally and bred without using genetic modification. These varieties may improve the weed control in countries such as Eastern Europe where the range of herbicides available is limited.

The worldwide demand of rapeseed oil and meal is increasing and the production must be adapted. Furthermore, the oilseed rape acreage will increase in areas with potential. In areas where the acreage cannot be increased, the breeding objective is to produce plants that have stabler and higher yields.

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