Proceedings of the LXV SIGA Annual Congress
Piacenza, 6/9 September, 2022
ISBN: **978-88-944843-3-5**

Poster Communication Abstract – 1.16

SELECTION AND CHARACTERIZATION OF NEW CAMELINA SATIVA VARIETIES: OUTLOOK 2022

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Camelina sativa, plant breeding, yield, bromatological analyses, GBS

Camelina sativa (*Camelina sativa* L. Crantz) is a promising oilseed crop used for different purposes. It is an herbaceous annual plant belonging to the Brassicaceae (Cruciferae) family originated from South Eastern Europe and South Western Asia.

The interest in this crop has increased significantly in recent years, especially for the short life cycle, the high oil content (up to 40%), the high level of unsaturated fatty acids (30-40% alpha linolenic acid, 15-25% linoleic acid, 15% oleic acid and about 15% eicosenoic acid fraction) and low-input agronomical practices. A limiting factor regarding the utilization of Camelina sativa is the presence of glucosinolates in the seeds that are sulfur-containing glucosides, mainly present in Brassicaceae, involved in plant defense.

In addition to the interest in oil, this crop has a lower environmental impact and the additional function of being able to be used in intercropping. Furthermore, the increase in the human and livestock population expresses a greater need to find new sources of proteins and oils. Therefore, crops like hemp, flax, crampe, castor (plants that produce highly unsaturated oils, such as Camelina, great for biolubricants) are coming back. This rapid spread is since the crop has several interesting traits, for instance it possesses a high ability to adapt to marginal soils

and to low input growing conditions and it has a higher resistance of siliques to dehiscence.

The aim of this work was to develop new varieties of camelina with high yields and oil content. The breeding program started from a study of the most used commercial varieties in Europe, that were characterized by molecular markers (SSRs) and subsequently by GBS (Genotyping by Sequencing) technique.

Furthermore, bromatological analyzes were carried out to better characterize the initial commercial germplasm. Merging the genetic and chemical data we selected the best parentals for the crosses.

The obtained generations were advanced in greenhouse and open field using “bulk selection” till F5 generation, then started the selections of the best plants. The progenies were evaluated and compared in open field with the initial commercial varieties under study using quality parameters for DUS examination (CPVO Technical Protocols).

The first multi-environment tests have being carried out to assess the real value of the new varieties obtained compared to commercial benchmark.

The best selected varieties will be characterized from a chemical point of view for oil content and composition. Furthermore, we are planning to perform a GBS-based GWAS analyses of oil content, flowering and yield traits with the aim to identify genome regions useful for further MAB programs.