COBRAF Project, Co-products from Biorefinery

The project, ended in January 2022 and lasted for 3 years, has been coordinated by **Chimica Verde bionet** (CVb), the Italian Association of Green Chemistry, and was carried out in the framework of the national activities related to the European strategy EIP-AGRI. The main purpose of the project was the establishment of a regional technical and logistic platform able to enhance the different fractions of some selected oil crops - oil, residual oilcake, straw and in some cases leaves and flowers - according to a biorefinery approach and aimed at achieving the highest profits for the primary producers. Concerning the development of the CVb platform, the technologies, techniques and practices adopted were demonstrated and tested in the framework of the Tuscany region (Italy),to those segments of supply chains identified as priorities. The project proposed and implemented a concrete model of bioeconomy, based on the economic valorization of each by-product from 4 oil crops: camelina, hemp, safflower and flax, all characterised by high nutritional and health properties such as polyunsaturated fatty acids and many other metabolites (e.g. vitamins, proteins, polyphenols, terpenes, glucosinolates, cannabinoids, lignans, etc.). The project was implemented by an Operational Group composed by 19 stakeholders including agricultural enterprises, industrial companies from various sectors (oils and fats, construction, motorhome accessories, textiles, food, pharmaceuticals), research bodies and associations.

The mainobjective of the project was the introduction of crops that, although cultivated in Europe from hundreds of years, can still be considered innovative in Tuscany and, overall, in national cultivation systems. Indeed, such plants are rich in active ingredients of considerable nutritional and cosmeceutical interest, able to improve soil fertility and agricultural income opportunities. Another important objective achieved was the optimisation of the processing chains for the different biomass fractions that allowed the development of innovative products for the industry orthe improvement of their production chains.

A more interconnected system of biorefineries allowing the maximum valorisation of the oil crops biomass is more flexible, can be used in rotation, and consequently allowsbetter incomes to farmers and user companies and a wide flexibility in market destinations.

The production system set up in Tuscany is a model that allows the use of different parts of biomass and production residues to develop innovative and more sustainable bioproducts for at least 6 industrial sectors: food, cosmetics, pharmaceuticals, construction, wood, automotive (camper vans). The results concerning sustainability are interesting for farmers and, in general, along the whole supply chain. However, there are still some critical points of the activated production chains that can be overcome through further research and experimentation activities.

KEY WORDS

Rural areas, biomass, by-product, circular bioeconomy, technological innovations, agricolture, crop ping syste

COUNTRY/REGION

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BRANCHES

BOOSTING RURAL BIOECONOMY NETWORKS FOLLOWING MULTI-ACTOR APPROACHES

ADDITIONAL INFORMATION

COBRAF's partner farms located in various parts of Tuscany, including the areas of Pisano, Fucecchio marshland and Valdichiana of Arezzo.
Their traditional productions, especially cereals, are seriously affected by the crisis in the sector. Because of that, some farms are introducing innovative crops in rotation with cereals with two objectives: diversifying income opportunities and fostering an improvement in soil quality and agroecosystem resilience.
The COBRAF project's main objective was to set up a regional bio-economy model based on products from four oil crops: camelina, hemp, safflower and flax. The project achieved the following results:

1. Introduced innovative crops with organic practices, to encourage new rotation systems, thus improving soil fertility and agricultural biodiversity;
2. Developed new products;
3. Provided new studies on oils and flours with high nutritional and cosmetic value from integrated short supply chains;
4. Produced non-toxic vegetable-based adhesives for the wood panel industry;
5. Produced vegetable dyes for the cosmetics industry;
6. Produced hemp-based building blocks;
7. Produced hemp fibre composites;
8. Developed new methods of extraction of cannabidiol (CBD) and other active ingredients from industrial hemp;
9. Through the involvement of "Rete Etruscum"(Arezzo, Italy), a project partner, implemented a new plant for shelling, cleaning and sorting a variety of agricultural biomass, mainly oil and medicinal crops;
10. established new industrial facilities to allow the mechanical extraction of oils and flours;
11. established an industrial scutching and retting plant for hemp fibre recovering to be mainly used in the textile and paper industry.

ABOUT BRANCHES

BRANCHES is a H2020 "Coordinaton Support Action" project, that brings together 12 partners from 5 different countries. The overall objective of **BRANCHES** is to foster knowledge transfer and innovation in rural areas (agricolture and forestry), enhancing the viability and competitiveness of biomass supply chains and promoting innovative technologies, rural bioeconomy solutions and sustainable agricultural and forest management.

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