SUMMARY FACTSHEET – HIGH ERUCIC ACID RAPESEED (HEAR)

PANACEA
Non Food Crops for a EU Bioeconomy

HEAR is an annual C3 crop in the family Brassicaceae cultivated as winter oilseed crop. HEAR is a rapeseed variety rich in erucic acid (C22:1) which can represents more than 50% of the oil content. Due to this composition, the oil is non edible and is used in chemistry where erucic acid is particularly sought after.

High Erucic Acid Rapeseed
Photo: Terres Univia, France

Primary end use: Cosmetics and chemicals
Preferred kind of soils: Medium and deep soils with a 6,5-7 pH. Not adapted to superficial soils, to water-logged soils or to drought conditions in Autumn.
Crop establishment: Autumn (end of August – End of September)
Plantation density: Seeding rate of 1,5-2,5 kg/ha
Production: Plantation lifetime of 11 months. Seed yield is approximately 3 t DM/ha and can reach 4 t DM/ha in favourable conditions.
Harvest: Beginning of July.

Crop assets and constraints:

Assets	Constraints
GMO-free	Lower yields than classical rapeseed
Same cultivation practices, material than classical rapeseed which makes it easier for farmers to adopt.	High nitrogen, phosphorus, sulphur and pesticides inputs.
No competition with food crops	Not adapted to drought conditions during the sowing dates.
Important role in the succession planting as starter crops and plays a positive role on the following cereal (higher yield and less inputs).	For the moment the demand is not high enough to increase the production.
Even if HEAR production requires a high quantity of inputs (nitrogen and pesticides), new cultivation practices are already implemented to improve the sustainability of the production: association with protein crops, natural substitution of pesticides, development of catch crops to limit the use of mineral nitrogen, …Technical institutes are very invested on these topics.	In order to preserve the high erucic acid content, the crop must be isolated from the classical rapeseed (known as double zero). Respect a minimum isolation distance of 50 meters. Risk of contamination of the food crop (rapeseed) and Risk of lower erucic content in HEAR in case of contamination.

Focus on:

Crop Establishment

Seeds are sown in Autumn between the end of August and the end of September depending on the soil conditions and if HEAR is associated with a protein crop. The seeding rate for HEAR is 1,5-2,5 kg/ha.

HEAR can be seeded with the same farm equipment than rapeseed which makes it easier for farmers to adopt.

Crop management

The key points of the management are the same than for classical rapeseed.

HEAR is a quite high input crop which needs high quantities of nitrogen, phosphorus and sulphur.

HEAR needs some herbicides and insecticides to resist to cabbage-stem flea beetle (*Psylliodes chrysocephala)* or slugs.

Harvest

HEAR is harvested at the beginning of July. When the pods turn yellow-brown they can be harvested.

HEAR can be harvested with conventional farm equipment which makes it easier for farmers to adopt.

Storage: optimum seed moisture content is 9-10%.

Potential biomass production according to location/soil nature and crop management

	Soil	Cycle duration	Harvest date	Seed production
Favorable situation	Medium and deep soils with a 6,5-7 pH	11 months	July	3-4 t DM/ha
Unfavorable situation	Superficial water-logged soil	11 months	July	2 t DM/ha

Production Costs
1200-1500 €/ha =>350-400 €/t DM

Production costs are relatively high compared to other oil crops, but yields are higher.

A price premium can exist for HEAR but it depends on the contract with the cooperative. Seed cakes are mostly sold without any prime despite their higher protein content

Environmental
Water consumption: Low, no need for irrigation
Nitrogen inputs: High
Phytosanitary inputs: Medium (herbicides and some insecticides).
Energy production/consumption: Total amount of energy used to produce 1 t DM of HEAR seeds: 5,9 GJ/ t DM.
Average net energy production from HEAR: 20,5 GJ/t DM.

Non-food valorizations:

- Nowadays use:
  - Cosmetics, fragrance and perfumes
  - Biochemicals (Lubricants, Slip agents, …)

- Developing use:

Chemicals (polymer additives with new properties for a wide range of products …)

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