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Roztocze hemp - An innovative technical solution for a hemp seeder

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"Innovative Hemp Practices"

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ROZTOCZAŃSKIE KONOPIE

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IUNG Institute of Soil Science and Plant Cultivation

Consortium: "Roztocze Hemp" Operational Group

1. **Leader**: Mariusz Rybak (farmer).
2. **Lublin Agricultural Advisory Center**: Marek Siuciak.
3. **University of Life Sciences in Lublin**: Zbigniew Krzysiak (research manager).
   Engineering team: Zbigniew Krzysiak, Waldemar Samociuk, Janusz Zarajczyk,
   Soil research team: Sławomir Ligęza, Joanna Gmitrowicz-Iwan,
   Plant research team: Sławomir Michałek,
   Central Research Laboratory.
4. **ROLTEX Sp. z o.o.** Technical and Trade Company (sowing unit manufacturer)

ROZTOCZAŃSKIE KONOPIE

UNIWERSYTET PRZYRODNICZY w Lublinie | WYDZIAŁ INŻYNIERII PRODUKCJI

LODR KONSKOWOLA

PROJECT DATA
Operational group: "Roztocze Hemp"

Implementation period: November 27, 2023 to December 31, 2024.
Total project budget: ~ 1000000 Euro
Financing sources: Rural Development Programme 2014-2020; own funds (30%)
Contract No.: 00125.DDD.6509.00219.2022.03

Historical Trend

1950s–1980s	Poland was one of the largest hemp producers in Europe. Estimated: tens of thousands of hectares (mainly for fiber).
1990s	Sharp decline – virtually no cultivation (symbolic acreage).
After 2010	Gradual return with EU regulations and increased interest in biomass and CBD.
Recent years (2018–2024)	Area typically ranged between 2,000–5,000 hectares, with significant year-to-year variability.

Benefits of growing hemp



- Due to its ease of cultivation, hemp can be a powerful driver for **converting land to organic agriculture** (OA), thus facilitating farmers' transition to more sustainable farming.
- **Cultivation itself is beneficial for the soil**: it allows for deep aeration, loosens the soil, uses little water, and guarantees good yields for subsequent crops.
- Hemp is easily incorporated into **crop rotations**. Spring barley, winter wheat, winter barley, and legumes are preferred preceding crops.
- Hemp requires **very few pesticides, insecticides, or herbicides**. Due to its high leaf density, it naturally suppresses weed growth.

Mariusz Rybak, a farmer from Zamość in the **Roztocze region** of Lublin, believes that hemp could account for 10% of his farm's crops.

Farm descritption:

- 120 hectares of land,
- sugar beet, rapeseed, and wheat,
- „redziny” generally fertile soils, but difficult to cultivate due to the large number of limestone undulating terrain,
- varying slope inclinations.

PROJECT PURPOSE

The goal of the operation was development of an innovative technical solution for a seeder in hemp cultivation using no-till sowing to improve yields and seed quality as well as protect soil, water and climate.

View of the tractor-sowing unit set

The seeder is a combination of three types of machines:
1. a seed drill,
2. a precision seeder,
3. a fertilizer spreader.



THE ESSENCE OF THE SEEDING UNIT

These three machines are connected mechanically, electrically, hydraulically, and pneumatically.

A control system is used, connected to an on-board computer in the cab of a parallel-guided agricultural tractor.



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All parts (seed drill, precision seeder, fertilizer spreader) are managed by an advanced control system from the tractor cab.



Field mapping:

CropView module allows you to create yield potential maps and develop fertilizer application maps based on them



Innovations introduced

1. The use of **reinforced coulters** and improved seed incorporation efficiency.
2. Adjustment of seed **sowing depth** and the ability to adapt it to soil conditions.
3. Simultaneous **application** of mineral **fertilizer and seeds**.
4. Adjustment of seed quantity and **fertilizer application rate** to varying **soil conditions** via the unit control system.




THANK YOU FOR YOUR ATTENTION

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Thank you!

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