



BBioNets

Boosting the adoption
of Bio-Based Technologies

Cross-Fertilisation Meetings

Bio-Based Practices on Farms & Forests

Accelerating “Bio-Based Practices on Farms and Forests”

Key Takeaways

CFM No2 “Innovative Hemp Practices”

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The second Cross-Fertilisation Meeting "Innovative Hemp Practices" highlighted how industrial hemp is emerging as a versatile bio-based crop capable of supporting Europe's transition toward low-carbon, circular and resilient agri-food systems. Across technical innovation in cultivation, agronomic performance, and new bio-based material applications, the speakers highlighted the growing strategic relevance of hemp within the bioeconomy.

A central message of the event was that **modern hemp cultivation practices and machinery innovations can significantly improve crop establishment, soil protection and overall production efficiency**. Precision sowing systems, including no-till and strip-till technologies, demonstrated how adapted equipment can overcome difficult soil conditions while enhancing seed placement, reducing disturbance, and protecting soil, water and climate. In addition, the integration of soil preparation, sowing and fertilisation into a single pass was shown to significantly reduce fuel consumption, labour requirements and overall cultivation costs, increasing the economic attractiveness of hemp for farmers.

Equally important were the agronomic advantages of hemp, which grows well under modest input requirements, naturally suppresses weeds, and improves soil structure, making it an excellent break crop within sustainable crop rotations. Long-term research in Ireland has shown hemp's value for fibre, construction, biocomposites and even energy uses, reinforcing its potential as a low-input crop aligned with climate and environmental targets.

From a market and value-chain perspective, hemp was presented as a multi-stream bioeconomic resource. Its stems, seeds and side streams feed into a wide range of applications—from construction materials and insulation to textiles, non-wovens, biocomposites, food and cosmetics. Growing demand for low-carbon building solutions, together with the expansion of wood-based construction, is opening opportunities for hemp-wood hybrid systems, prefabricated panels, hempcrete and insulation products.

The meeting also underlined that scaling the hemp sector depends on coordinated value-chain development, including investment in regional processing infrastructure, access to harvesting machinery, standardisation and certification (particularly in construction), and new cooperation models such as shared processing hubs and cooperatives. A concrete example discussed was the long-established French cooperative model (e.g. La Chanvrière), demonstrating how shared ownership of processing infrastructure can successfully align farmers, processors and markets at scale. These elements are essential to bridge the gap between farmers and processors and to unlock the full economic value of hemp.

Overall, the event confirmed that industrial hemp has the potential to become a foundational crop of the European bioeconomy, delivering agronomic, environmental and market benefits—



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provided that technical innovation, processing infrastructure and integrated value chains evolve together.

Roztocze hemp – An innovative technical solution for a hemp seeder

Presenter: *Magdalena Borzecka* – Associate Professor, [Institute of Soil Science and Plant Cultivation \(Poland\)](#)

- **Need for specialized no-till sowing technology for hemp cultivation** - The long absence of large-scale hemp farming in Poland resulted in a lack of suitable machinery, especially for difficult soils. This gap was addressed by developing a no-till sowing system adapted to hemp to improve seed quality and yields while reducing soil disturbance and environmental impact.
- **Integrated multi-component sowing platform** - A fully coordinated system combining strip-till, precision seeding and fertilisation equipment into one unit, operated through advanced onboard controls that synchronise every stage of the sowing process for greater efficiency and consistency.
- **Enhanced durability and performance of sowing elements** - To address the frequent breakage of standard coulters in difficult soils, the technical team redesigned the coulters, introducing new shapes and stronger metal alloys capable of withstanding demanding field conditions. These reinforced parts significantly improved the reliability of the sowing process and ensured more efficient seed incorporation, enabling the machinery to operate effectively on challenging terrain where traditional equipment failed.
- **Precision application through digital field mapping** - The system enables the simultaneous application of seeds and mineral fertiliser while providing the ability to adjust sowing depth and input rates according to real-time field conditions. Through yield potential maps and fertiliser application maps, the operator can tailor the process to specific soil variability across the field. This digital, site-specific approach improves sowing accuracy, optimises nutrient use, and supports a more efficient and environmentally responsible no-till cultivation system.

“Bio-based innovative no-till sowing technology can enable reliable hemp production in difficult soils while limiting environmental impacts.”

Insights from Teagasc Hemp Research

Presenter: *Barry Caslin* – Energy & Rural Development Specialist, [TEAGASC - Irish Agriculture and Food Development Authority \(Ireland\)](#)

- **Long-established research base for industrial hemp in Ireland** - Hemp has been studied in Ireland since the 1960s across fibre, paper, textiles, MDF and energy applications, providing a strong foundation of agronomic knowledge and crop performance data. This long-standing expertise provides Ireland with a strong foundation for reintroducing and scaling hemp within modern agricultural and bio-based value chains.
- **Agronomic benefits supporting sustainable crop rotations** - Hemp grows well with modest fertiliser requirements, very limited need for pesticides or herbicides, and strong natural weed suppression. Its height, dense canopy and vigorous rooting system improve soil structure, reduce compaction and return nutrients through leaf drop, making hemp an excellent rotational “break crop.” These attributes support reduced chemical use, healthier soils, and more resilient rotation planning for arable farmers.
- **Potential for energy production and low-carbon material markets** - Research showed that hemp performs competitively as an energy crop and fits annual biomass systems. Its fibres and shiv are increasingly in demand for bio-based industrial applications, including biocomposites for vehicles, natural insulation materials and construction products such as hempcrete. These emerging markets position



hemp as a valuable contributor to low-carbon materials, renewable energy pathways and climate-aligned industrial innovation.

- **Harvesting and processing constraints limiting farmer adoption-** Hemp can be difficult to harvest with unsuitable machinery, and lack of decortication and fibre-processing capacity. This absence of infrastructure limits market access and restricts scale-up opportunities.
- **Need for regulatory clarity, processing infrastructure and cooperative models-** It was highlighted that regulatory uncertainty—particularly around CBD and THC thresholds—continues to hinder investment and sector development and at the same time, the absence of regional processing hubs and industry standards slows market growth. So the need for clearer regulations, dedicated infrastructure and coordinated producer-processor collaboration are essential for hemp to integrate fully into bioeconomy.

“Bio-based technologies, such as industrial hemp, can deliver agronomic, environmental and economic benefits across agri-food systems and bioeconomy.”

Potential of industrial hemp in bioeconomy

Presenter: **Hana Gabrielová** – President, [CzeczHemp-ČESKÝ KONOPNÝ KLASTR, Z.S.](#) (Czech Republic)

- **Recognition of hemp in EU bioeconomy strategy** – The 2025 EU Bioeconomy Strategy now identifies industrial hemp as a strategic bio-based material for textiles and construction, signalling stronger policy support, standardisation needs and future funding opportunities.
- **Multi-stream biomass for resilient value chains** - Industrial hemp provides multiple valuable outputs—long and short fibres, hurd, seeds, oils and side-streams such as material for biochar—helping Europe move from single-output crops to diversified biomass systems. This multi-stream structure strengthens supply security, supports circular use of resources, and links agriculture with the construction, textile, food, feed and biocomposite industries.
- **High potential in construction and wood-based material systems** - Hemp’s fast growth, low carbon footprint and high biomass productivity make it an ideal complement to the expanding wood-based construction sector. It supports the development of hempcrete, insulation, prefabricated panels and hemp–wood hybrid systems, all of which meet rising demand for healthy indoor environments and low-carbon building materials. As wood supply is limited by long renewal cycles, hemp offers a rapidly renewable alternative that can stabilise supply chains.
- **Expanding applications in textiles, biocomposites and innovative materials** - Beyond construction, industrial hemp is increasingly used in non-woven textiles, automotive interiors, geotextiles, landscaping materials, insulation, furniture, sports equipment and hospitality interiors. These expanding applications reflect a rapidly growing market for bio-based, circular and high-performance materials, driven by sustainability targets and consumer demand for natural alternatives.
- **System-level economic value requiring integrated value chains** – Hemp’s economic potential lies not in single commodities but in integrated value chains that connect farming with processing and industry. Current barriers—including lack of regional processing infrastructure, limited harvesting equipment, variability in raw material quality, and the well-known “chicken-and-egg” gap between farmers and processors—prevent large-scale expansion. Solutions highlighted include regional processing hubs, standardisation, rapid quality classification, LCA data, cooperative or cluster-based models, and coordinated investment to unlock the sector’s full bioeconomic potential.

“Industrial hemp illustrates the potential of bio-based technologies to connect agriculture with materials, construction and industry within a circular bioeconomy.”



Download the presentations

Watch the recording

What are Cross-Fertilisation Meetings?

BBioNets' **Cross-Fertilisation Meetings** are essential events designed to connect the project's regional **Forest and Agriculture Networks (FANs)**. While each FAN addresses unique **regional realities and specific challenges**, there is significant common ground regarding biomass availability, exploitation potential, and shared needs. By networking across borders, the project aims to collectively increase the impact of local work significantly.

These meetings were designed to help participants:

- **Share Difficulties:** Exchange common challenges and concerns regarding the application and scaling of **Bio-Based Technologies (BBTs)**.
- **Discover Opportunities:** Outline new breakthroughs, emerging technologies, and potential market opportunities across regions.
- **Promote Knowledge:** Capture, validate, and widely promote practical knowledge created by national EIP-AGRI Operational Groups (OGs).
- **Forge Collaborations:** Facilitate bilateral and multilateral collaboration opportunities among FANs and OGs.

The Six-Part Series: Topics and Schedule

1. **Innovations in Nutrient Recovery:** 11 December 2025
2. **Innovative Hemp Practices:** 15 January 2026
3. **Sustainable Sheep Wool Processing:** 29 January 2026
4. **Efficient Woody Biomass Utilisation:** 12 February 2026
5. **Circular Approaches in Olive Groves:** 26 February 2026
6. **Opportunities in Green Biorefineries:** 23 April 2026

BBioNets Project Identity

Full Project Title	BBioNets – Creation and promotion of Forest and Agriculture Networks to boost Bio-Based Technologies adoption and Value Chain development (GA No 101133904)		
Start – end date	1/11/2023 – 31/10/2026 (36 months)		
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