MARCH NEWSLETTER

PowerWorms: Vermicomposting; The Future of Sustainable Agriculture and Organic Waste Management in Europe

"Innovations in Sustainable Agriculture"

March 2025

ERASMUS+ PROGRAMME KA2: COOPERATION FOR INNOVATION AND THE EXCHANGE OF GOOD PRACTICES IN VOCATIONAL EDUCATION

Project Name: Vermicomposting: The Future of Sustainable Agriculture and Organic Waste Management in Europe

Project Acronym: PowerWorms

Project Number: 2021-1-TR01-KA220-VET-000030021

Dear readers,

Welcome to the March 2025 edition of the PowerWORMS Newsletter.

As the spring planting season begins across much of Europe, we turn our attention to a theme that lies at the heart of both ecological regeneration and agricultural innovation: the circular economy. Under the title "From Waste to Worth: Circular Economy in Organic Farming," this month's issue explores how organic waste—often overlooked or discarded—is being transformed into one of the most powerful assets in sustainable food systems.

In today's world, where land degradation, soil fertility loss, and unsustainable input costs pose growing threats to farmers, the ability to close resource loops and regenerate soil ecosystems has never been more critical. Circular practices such as vermicomposting, on-farm nutrient cycling, and organic by-product reuse allow farmers to reduce dependency on external chemical inputs, cut waste at the source, and restore long-term soil health. These practices not only protect the environment—they also strengthen farm economies, enhance food resilience, and bring communities closer to nature-based solutions.

At PowerWORMS, we see vermicomposting as more than just a method—it's a mindset. One that recognizes that nothing in nature is ever truly wasted. When applied intentionally, the principles of the circular economy align beautifully with the rhythms of farming: decomposition becomes rebirth, waste becomes value, and soil becomes not just a growing medium, but a living foundation for regeneration.

This month's issue dives into:

- The untapped potential of organic by-products in agriculture
- The role of vermicomposting in regenerative and circular farming systems
- How farmers are recycling nutrients to reduce inputs and improve resilience
- The policy momentum behind circular agriculture in the EU Green Deal
- And how you can participate in shaping a circular future—whether as a grower, educator, student, or advocate

As you explore these pages, we invite you to think about your own relationship with waste. What could you turn into value? What resources are hidden in plain sight on your farm, in your garden, or in your community?

Together, we can move from extractive models to restorative ones—from linear thinking to circular wisdom. Because in a truly sustainable system, nothing is lost. Everything returns.

Yours in regeneration, **The PowerWORMS Team**

DISCLAIMER

E

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

E

El apoyo de la Comisión europea para la producción de esta publicación no constituye una aprobación del contenido, el cual refleja únicamente las opiniones de los autores, y la Comisión no se hace responsable del uso que pueda hacerse de la información contenida en la misma.

G

Η υποστήριξη της Ευρωπαϊκής Επιτροπής για την παραγωγή αυτής της έκδοσης δεν συνιστά έγκριση του περιεχομένου το οποίο αντικατοπτρίζει μόνο τις απόψεις των συγγραφέων, και η Επιτροπή δεν μπορεί να θεωρηθεί υπεύθυνη για οποιαδήποτε χρήση των πληροφοριών που μπορεί να περιέχονται σε αυτήν

M

Поддршката на Европската комисија за изработката на оваа публикација не претставува одобрување на содржината, која ги одразува само гледиштата на авторите и Комисијата не може да биде одговорна за каква било употреба на информациите содржани во неа.

N

De steun van de Europese Commissie voor de productie van deze publicatie houdt geen goedkeuring in van de inhoud, die uitsluitend de standpunten van de auteurs weergeeft, en de Commissie kan niet verantwoordelijk worden gehouden voor enig gebruik dat kan worden gemaakt van de daarin opgenomen informatie.

T

Avrupa Komisyonu'nun bu yayının üretimine verdiği destek, sadece yazarların görüşlerini yansıtmakta olup içeriğin onaylandığı anlamına gelmez ve Komisyon burada yer alan bilgilerin herhangi bir şekilde kullanılmasından sorumlu tutulama

Table of Contents

Introduction: Redefining Waste: The Value of Organic By-products

In modern agriculture, the concept of waste has evolved beyond being a mere by-product of production processes—it is now recognized as a potential resource that, when repurposed, can contribute significantly to the sustainability and resilience of farming systems. Organic by-products, including crop residues, food scraps, and animal manure, contain essential nutrients and organic matter that are crucial for maintaining and enhancing soil fertility. When these materials are redirected from waste streams and reintegrated into agricultural practices, they create a closed-loop system that not only reduces environmental impact but also adds economic value to the farm (Balasubramanian, 2024).

Research has demonstrated that traditional linear models of agriculture—where inputs are used and waste is discarded—are not sustainable in the long run. Instead, a circular economy model, in which organic by-products are re-cycled, offers a promising solution for reducing dependency on synthetic fertilizers and mitigating soil degradation. For example, studies have shown that incorporating crop residues into the soil can enhance water retention, improve soil structure, and stimulate microbial activity, ultimately leading to increased plant productivity and resource-use efficiency (Elissen et al., 2023). This process of transformation—from waste to a valuable input—is pivotal in meeting the challenges posed by both resource scarcity and environmental degradation.

Vermicomposting, a biological process that leverages earthworms to decompose organic materials, is a prime example of how waste can be converted into wealth. It not only transforms organic residues into nutrient-rich biofertilizer but also improves soil organic carbon levels and creates a conducive environment for beneficial microbial communities (Meghwanshi, 2024). This dual function of enhancing soil fertility while conserving water makes organic by-product reuse a core tenet of sustainable agricultural practices. The integration of these practices is particularly crucial in the context of the European Green Deal, which emphasizes the need for a circular economy to achieve long-term food security and environmental sustainability (European Commission, 2024).

Furthermore, the economic implications of redefining waste are significant. By converting what was once considered waste into a marketable product, farmers can reduce input costs, boost crop yields, and generate additional revenue streams. This shift not only supports farm profitability but also aligns with global sustainability goals, as it reduces the environmental footprint associated with synthetic fertilizers and minimizes nutrient runoff into water systems (Fountas et al., 2024). It is this convergence of economic and environmental benefits that underscores the transformative power of a circular agricultural model.

In summary, redefining waste as a resource encourages a paradigm shift in agricultural practices. It emphasizes the continuous recycling of nutrients, the reduction of landfill waste, and the enhancement of soil and water conservation. As we move forward, embracing organic by-product reuse will be essential for creating resilient, sustainable farming systems that can thrive in the face of growing ecological challenges.

Vermicomposting and the Circular Model

In the pursuit of sustainable agricultural practices, vermicomposting has emerged as a pivotal component of the circular economy model. This process involves the decomposition of organic waste by earthworms—most commonly Eisenia fetida—resulting in nutrient-rich vermicompost that enhances soil fertility and structure. By converting discarded organic matter into valuable agricultural inputs, vermicomposting epitomizes the principles of resource efficiency, waste reduction, and biological regeneration, all of which are central tenets of circular economy frameworks (European Commission, 2020).

Vermicompost is renowned for its high content of macro- and micronutrients, such as nitrogen, phosphorus, potassium, calcium, and magnesium, as well as enzymes and plant growth-promoting hormones like auxins and gibberellins (Edwards et al., 2011). Numerous studies have shown that applying vermicompost to soil improves porosity, aggregation, and water retention, while increasing microbial biomass and biodiversity, including beneficial fungi and nitrogen-fixing bacteria (Lazcano & Domínguez, 2011). These properties contribute not only to greater plant resilience and higher yields, but also to a reduction in soil-borne diseases and the need for chemical fertilizers and pesticides—thereby lowering production costs and environmental risks (Pathma & Sakthivel, 2012).

Crucially, vermicomposting contributes to climate change mitigation. Organic waste in landfills emits large quantities of methane (CH_4), a greenhouse gas 25 times more potent than CO_2. By diverting food scraps and crop residues from landfill sites and processing them through vermiculture, methane emissions can be dramatically reduced (EPA, 2021). Moreover, the carbon sequestered in soils through repeated applications of vermicompost enhances the soil's role as a carbon sink, further contributing to greenhouse gas reduction goals (Lal, 2015). As a nature-based solution, vermicomposting aligns with global strategies for low-carbon agriculture.

From a socio-economic perspective, vermicomposting creates opportunities for local entrepreneurship and community empowerment. Smallholder farmers, cooperatives, and youth-led enterprises can establish low-tech, decentralized vermicompost units, using local organic waste streams. These systems are scalable and adaptable to rural, peri-urban, and even urban settings—making them ideal for developing circular bioeconomies at the grassroots level (Arancon et al., 2008). Additionally, the process is relatively low-cost and low-energy, requiring minimal inputs beyond the organic matter itself and proper moisture conditions.

Lastly, the implementation of vermicomposting supports several key goals of the European Green Deal and the Farm to Fork Strategy, both of which emphasize circular economy transitions, reduced synthetic inputs, and enhanced soil health. EU-funded initiatives

increasingly support the integration of vermicomposting into organic waste management systems and regenerative agricultural models. Educational programs, vocational trainings, and policy incentives are also expanding to promote wider adoption of this technique among farmers and municipalities across Europe (European Commission, 2023).

In conclusion, vermicomposting represents a biological bridge between waste management and agricultural regeneration. By transforming organic waste into a high-value soil amendment, it not only enhances crop production and soil vitality, but also fosters climate resilience and circular innovation. As such, vermicomposting should be viewed not as an alternative—but as a central pillar of any strategy aiming to close nutrient loops, restore degraded land, and make farming systems more sustainable for future generations.

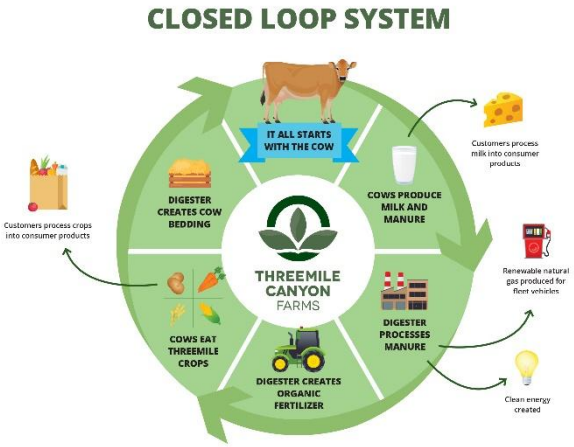
Closed-Loop Farms: How Farmers Are Recycling Nutrients

In the ongoing transition toward regenerative agriculture, closed-loop farming systems represent one of the most promising approaches for reducing environmental impact while enhancing long-term productivity. At its core, a closed-loop farm is designed to minimize external inputs and internal waste by recycling nutrients, organic matter, water, and energy. These systems challenge the linear "take-make-waste" model that dominates industrial agriculture and instead strive to emulate natural ecosystems, where every output becomes an input in another part of the cycle (Ellen MacArthur Foundation, 2023).

The Nutrient Cycle Reimagined

The central principle of closed-loop agriculture is nutrient cycling. Rather than treating manure, crop residues, or food scraps as waste, these by-products are reintegrated into the system as valuable resources. Through composting, vermicomposting, and anaerobic digestion, farmers can convert organic residues into bioavailable fertilizers that enrich soil fertility and structure. According to UC Davis Agricultural Sustainability Institute (n.d.), nutrient recycling practices can significantly reduce reliance on costly synthetic fertilizers and improve soil health indicators, including carbon content, microbial biomass, and water-holding capacity.

On mixed-use farms, the integration of livestock and crop production allows manure to be used directly or after processing, further closing the loop. Crop-livestock systems are not new, but modern adaptations—supported by digital monitoring and microbial inoculants—have made them more efficient and scalable. Manure management systems not only deliver nutrients like nitrogen and phosphorus but also help balance soil pH and reduce erosion risk when properly applied (Nguyen & Seddaiu, 2022).

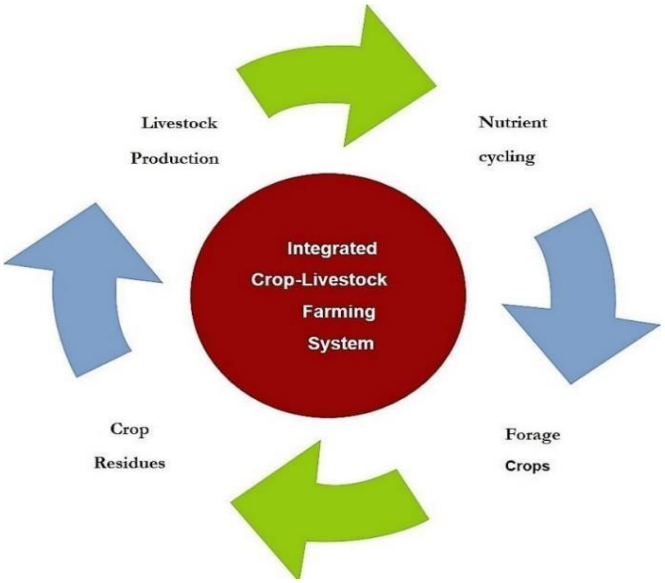


Technology as an Enabler of Closed-Loop Models

In recent years, technology has amplified the scalability and precision of nutrient recycling. Anaerobic digesters are now used not just on large industrial farms but also in medium-sized operations, producing biogas for on-farm energy use and digestate that serves as an organic amendment. This dual benefit aligns with the principles of the bioeconomy—producing renewable resources while minimizing waste (European Commission, 2020).

Aquaponics systems exemplify circularity on a smaller, controlled scale. In these systems, fish waste provides nutrients for hydroponic plant cultivation, and plants help purify water, which is then recirculated back to the fish tanks. Studies indicate that aquaponics can use up to 90% less water than conventional soil-based systems, making it an ideal model in drought-prone areas (Love et al., 2015). Other innovations include sensor-based manure spreading technologies, microbial bio-digesters,

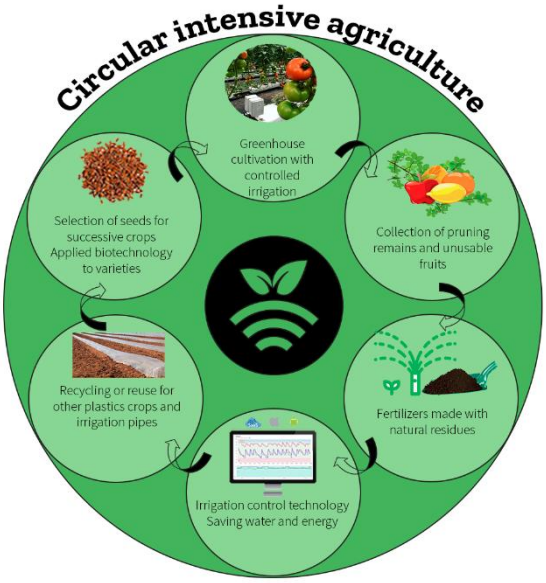
and automated composting systems, all of which enhance the efficiency of closed-loop operations.



Economic and Environmental Benefits

Implementing a closed-loop approach has tangible benefits for farmers. On the economic side, nutrient recycling reduces input costs, such as fertilizer and irrigation, while improving farm-level resilience by decreasing dependence on volatile global supply chains (Zilberman et al., 2018). Environmentally, it leads to a reduction in greenhouse gas emissions, particularly methane from manure and nitrous oxide from over-fertilized soils. Moreover, it lowers the risk of nutrient runoff into waterways, one of the leading causes of eutrophication and biodiversity loss in aquatic ecosystems (FAO, 2022).

Circular farms also contribute to climate adaptation. Soils enriched with organic matter retain more moisture and are better equipped to withstand drought and flooding. Additionally, increasing soil organic carbon through compost application is now widely recognized as a carbon sequestration method, directly supporting climate mitigation goals outlined in the EU Soil Strategy for 2030 (European Commission, 2021).



Social Impact and Community Engagement

Beyond farm gates, closed-loop systems can foster stronger ties between agriculture and the community. Urban agriculture initiatives, for example, are increasingly integrating composting hubs that serve local gardens and greenhouses. Food waste from homes, restaurants, and markets is collected, composted, and returned to urban soils—completing a truly local nutrient loop. This not only diverts waste from landfills but also empowers citizens to engage directly with the food system (Graham et al., 2022).

Educational initiatives and vocational training programs—like those promoted by PowerWORMS—can scale the impact of closed-loop thinking by equipping farmers, students, and educators with the knowledge to implement these systems. Furthermore, policy support, including subsidies for composting infrastructure and regulations that permit the safe reuse of organic waste, are crucial for wider adoption.

Closed-loop farming is not just a technical solution; it represents a **paradigm shift** toward regenerative and circular thinking in agriculture. By capturing and reusing nutrients within the system, farms can reduce costs, improve environmental outcomes, and increase resilience to climate change. While challenges remain—particularly around infrastructure,

education, and scalability—the potential benefits make closed-loop systems a cornerstone of future-proof agriculture. As we collectively seek to transition toward a more circular food economy, these nutrient-cycling models offer both inspiration and a practical path forward.

Policy & Practice: Circular Agriculture in the European Green Deal

As Europe grapples with biodiversity loss, soil degradation, and the growing impacts of climate change, the European Green Deal (EGD) offers a transformative roadmap to reshape agriculture into a more sustainable, circular, and regenerative system. Within this vision, circular agriculture—the strategic use and reuse of resources within farming systems—has become a central pillar. Rather than focusing solely on productivity, EU institutions are now placing greater emphasis on resource efficiency, waste reduction, nutrient recycling, and soil health (European Commission, 2020).

From Strategy to Implementation: EU-Level Policies Advancing Circularity

At the heart of the Green Deal is the Farm to Fork Strategy, launched in 2020, which aims to make food systems fair, healthy, and environmentally friendly. A key objective of the strategy is to reduce nutrient losses by at least 50% and fertilizer use by 20% by 2030, while increasing organic farming practices. These goals are supported by reforms to the Common Agricultural Policy (CAP), which now rewards sustainable soil and nutrient management through eco-schemes and agri-environmental climate measures (European Commission, 2021).

The Circular Economy Action Plan complements this by promoting better valorization of organic waste streams. EU Member States are encouraged to invest in infrastructure for composting, anaerobic digestion, and bio-based product development—all of which are integral to circular agriculture. The Commission has also introduced a Soil Health Law (proposal in 2023), which will require Member States to monitor, protect, and restore soil health, treating soils as a non-renewable resource central to climate adaptation and food security (European Commission, 2023a).

Targets, Tools, and Regulations Driving Circular Agriculture

Several key tools and targets are now in play:

- EU Soil Strategy for 2030: Aims for all European soils to be in healthy condition by 2050, with interim goals that push for circular soil nutrient flows and organic matter restoration (European Commission, 2021).
- Waste Framework Directive: Mandates separate collection of bio-waste, aiming to reduce landfill use and enhance composting and vermicomposting (Directive 2018/851/EU).
- EU Fertilising Products Regulation (EU 2019/1009): Allows for the use of compost, digestate, and other bio-based materials in certified fertilisers—enabling circular materials to enter the commercial market.

Together, these frameworks provide regulatory backing and financial incentives for farmers and agri-businesses to implement circular systems on the ground.

Challenges in Operationalizing Policy at Farm Level

Despite strong policy direction, implementation varies across Member States. Some farmers report gaps in access to technical advice, infrastructure, or markets for organic waste-derived products. In newer EU countries or rural areas, awareness and training around circular practices remain limited. Moreover, the complexity of regulations—particularly regarding waste classification, fertiliser standards, and organic inputs—can discourage adoption, especially for smallholders (Pineiro et al., 2022).

Addressing these challenges requires a multi-

level approach: increasing investment in rural infrastructure, supporting innovation through Horizon Europe, and strengthening education and extension services to ensure farmers understand and benefit from circular principles.

The Role of EU-Funded Projects and Initiatives

EU-funded initiatives such as LIFE AGRESTIC, Soil Mission EU, BIONEXT, and PowerWORMS are central to testing and scaling circular practices. These projects explore innovative nutrient cycling models, vermicomposting systems, and educational tools to build capacity at farm, community, and policy levels.

PowerWORMS, for example, not only promotes the use of vermicomposting as a closed-loop solution but also connects the dots between waste valorization, soil regeneration, and green skills development. By piloting and disseminating best practices across sectors—from vocational training to cooperative-based farming—it embodies the Green Deal's emphasis on collaborative, transnational action.

The European Green Deal offers a powerful framework for mainstreaming circular agriculture, but turning vision into action requires alignment across policy, practice, and education. Circularity in agriculture cannot be imposed from above—it must be embedded in the daily realities of farmers, educators, and agri-entrepreneurs. With the right incentives, knowledge sharing, and infrastructure, Europe can lead the global transition toward food systems where nothing is wasted, and everything returns—just as it does in nature.

Trainings and Calls to Action: How You Can Join the Circular Future

Transitioning toward a circular agricultural model is not only about technologies or policies—it is fundamentally about people. Circular systems flourish when farmers, educators, policymakers, students, and citizens are empowered with the skills, tools, and mindset to think regeneratively. While the science and policy of circular agriculture evolve rapidly, one thing remains clear: widespread adoption depends on capacity-building, community participation, and education for transformation.

Vocational and Academic Programs Supporting Circular Agriculture

A wave of new educational offerings—both online and in-person—is helping to prepare the next generation of agricultural professionals to implement closed-loop systems, manage organic waste streams, and champion soil health:

- The European School of Sustainability Science and Research (ESSSR) offers a Certificate in Circular Bioeconomy, blending academic theory with real-world agricultural case studies across the EU. The course covers organic waste valorization, nutrient cycles, and low-input farming systems, attracting learners from both rural and urban contexts (ESSSR, 2024).
- The PowerWORMS Project has launched modular training packages that combine practical vermicomposting, green entrepreneurship, and digital storytelling for sustainability. These modules are tailored for both formal VET providers and non-formal educators, ensuring that learning reaches diverse groups including women cooperatives, smallholder farmers, and youth associations.
- Leading agricultural universities—like Wageningen University & Research (Netherlands) and SLU (Sweden)—have embedded circular economy modules into agroecology, soil science, and rural development programs. These programs often include action-learning components, where students co-design circular systems on working farms or in community gardens (WUR, 2023).
- The GreenSkills Hub, supported by Erasmus+ and the EU Pact for Skills, recently introduced blended learning curricula on "Circular Design Thinking for Agriculture," connecting climate literacy with design tools for nutrient flows, water reuse, and on-farm resource loops.

These academic and vocational tracks are crucial in developing a workforce that not only understands circularity—but can lead its implementation at all scales of agriculture.

Workshops, Webinars, and On-the-Ground Demonstrations

Beyond formal education, short-format and community-based learning experiences provide low-barrier access to circular agriculture knowledge and practices:

- Compost School Europe hosts hands-on workshops each spring and autumn in Germany and the Netherlands, guiding participants in building low-cost, decentralized composting units using local food waste, garden residues, and farm by-products.
- The FAO E-learning Academy released the 2025 module "Closing the Loop: Nutrient Recycling in Smallholder Farms"—a free course designed to support farmers in resource-scarce regions to build simple yet effective circular systems using local materials (FAO, 2025). The course includes case studies from Ethiopia, Nepal, and Spain.
- In Italy, Spain, and Germany, local authorities have launched community-scale worm composting hubs. These serve not only as infrastructure for waste management, but also as living laboratories, where citizens learn about soil ecosystems, food sovereignty, and the bioeconomy. Municipalities such as Bologna and Freiburg have integrated these hubs into environmental education programs, involving schools and elder communities alike.
- Living Labs for Circular Agriculture, piloted through Horizon Europe projects like BIONEXT and DEMETER, offer farmers and stakeholders opportunities to co-create and test circular solutions in real-world settings, with access to mentorship, digital monitoring tools, and peer exchange across borders.

Such programs support not just learning, but community empowerment—ensuring that the knowledge of circularity is embedded not only in institutions, but in daily practice and collective culture.

Empowering Change Through Practical Action

Training alone is not enough without opportunities to apply new knowledge. Fortunately, many initiatives now bridge the gap between learning and doing by offering microgrants, fellowships, seed funding, and mentorship:

- The EIT Food "From Waste to Value" Challenge invites youth teams and farmer cooperatives to submit ideas for organic waste valorization and nutrient cycling, with selected projects receiving coaching and startup funding.
- Through PowerWORMS, partner cooperatives and VET institutions in Türkiye, Hungary, and Italy are piloting local compost entrepreneurship incubators, where trainees manage real compost systems, develop branding strategies, and sell surplus biofertilizer to local markets.
- Youth Climate Councils in Denmark and Slovenia have launched initiatives to integrate composting into school gardens and urban farms, making learning tangible and tied to everyday life.

The Future Needs You

Circular agriculture isn't a distant idea. It's already happening—in schools, farms, gardens, and neighborhoods across Europe and beyond. And it needs you.

Whether you're an experienced farmer looking to reduce input costs, a teacher developing green curricula, a policymaker writing environmental mandates, or a young activist planting your first compost pile, your actions contribute to a broader system of restoration and renewal.

In the spirit of the circular model, knowledge multiplies when it's shared, and systems strengthen when everyone plays a part. Let's build that future—together.

Join Our Movement

As we navigate the crossroads of environmental responsibility and digital innovation, the PowerWORMS project continues to foster a community committed to transforming organic waste management and agriculture through scalable, smart, and sustainable solutions. But we cannot do this alone. Your involvement—whether as a practitioner, educator, policymaker, student, or simply an enthusiast—plays a vital role in driving this movement forward.

Share Your Story, Inspire Others

Have you integrated Artificial Intelligence into your sustainable farming practices? Are you experimenting with IoT-enabled vermicomposting systems? Whether you're running a small worm bin at home or managing a full-scale organic farm, we want to hear from you. Real-world stories and grassroots experiences offer invaluable perspectives and can inspire others across Europe and beyond to take the first step toward a circular, green economy.

You can contribute by:

- Writing a guest article for our upcoming newsletters
- Showcasing your composting or AI project on our website
- Joining peer-learning exchanges and webinars
- Collaborating on pilot studies or training programs

To submit your story or express interest, contact us at info@powerworms.org or visit www.powerworms.org.

Connect With Our Community

We are building a vibrant community of forward-thinkers who believe that small, local actions can drive global change. Follow us on social media, join our online discussions, and participate in our monthly campaigns:

- Use the hashtag #AI4WORMS to join the conversation
- Share your vermicomposting photos, tips, or video demos
- Vote on upcoming training topics or sustainability themes
- Recommend a local educator, innovator, or farmer for a feature

Stay informed about upcoming training events, international project calls, and open-access resources tailored to your role in the agricultural ecosystem. Whether you are a rural farmer, urban gardener, tech enthusiast, or policy advocate, there's a place for you in the PowerWORMS ecosystem.

Be a Catalyst for Change

By joining our movement, you're not only adopting more sustainable agricultural practices—you're empowering your community, reducing environmental impact, and contributing to a digital transition that respects the Earth's natural cycles.

Together, we can:

- Reduce agricultural waste
- Improve soil health
- Support biodiversity
- Promote circular economy principles
- And most importantly, cultivate a culture of innovation and cooperation

We believe that every individual has the potential to make a difference. Let's build that future—smarter, greener, and together.

References

Arancon, N. Q., Edwards, C. A., Bierman, P., Metzger, J. D., & Lucht, C. (2008). Effects of vermicomposts on growth and marketable fruits of field-grown tomatoes, peppers and strawberries. Bioresource Technology, 93(2), 139–144. https://doi.org/10.1016/S0960-8524(01)00186-3

Balasubramanian, G. (2024). Cutting-Edge Agriculture Technology: Transforming Farming for a Sustainable Future. European Economic Letters, 14(1), 463–473. https://doi.org/10.52783/eel.v14i1.1049

Directive (EU) 2018/851. (2018). Amending Directive 2008/98/EC on waste. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018L0851

Elissen, H. J. H., van der Weide, R., & Gollenbeek, L. (2023). Effects of vermicompost on plant and soil characteristics – a literature overview. Wageningen Research, Report WPR-995. https://doi.org/10.18174/587210

Ellen MacArthur Foundation. (2023). Circular agriculture and nutrient cycling. https://ellenmacarthurfoundation.org

European Commission. (2020). A new Circular Economy Action Plan. https://ec.europa.eu/environment/circular-economy/

European Commission. (2021). EU Soil Strategy for 2030: Reaping the benefits of healthy soils for people, food, nature and climate. https://environment.ec.europa.eu

European Commission. (2023). Farm to Fork Strategy: For a fair, healthy and environmentally-friendly food system. https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

European Commission. (2023a). Proposal for a Soil Monitoring and Resilience Law. https://environment.ec.europa.eu/publications/soil-monitoring-and-resilience-law_en

European Commission. (2024). Water – European Commission – Environment. https://environment.ec.europa.eu/topics/water_en

FAO. (2022). The state of the world's land and water resources for food and agriculture. https://www.fao.org/3/cb9910en/cb9910en.pdf

Fountas, S., Espejo-García, B., Kasimati, A., Gemtou, M., Panoutsopoulos, H., & Anastasiou, E. (2024). Agriculture 5.0: Cutting-Edge Technologies, Trends, and Challenges. IT Professional, 26(1), 40-47. https://doi.org/10.1109/MITP.2024.3358972

Graham, K., Anderson, C., & Garcia, E. (2022). Urban composting and closed-loop community food systems: Lessons from pilot projects in Europe. Sustainability, 14(3), 1263. https://doi.org/10.3390/su14031263

Lal, R. (2015). Restoring soil quality to mitigate soil degradation. Sustainability, 7(5), 5875–5895. https://doi.org/10.3390/su7055875

Love, D. C., Fry, J. P., Genello, L., Hill, E. S., Frederick, J. A., Li, X., & Semmens, K. (2015). An international survey of aquaponics practitioners. PLOS ONE, 9(7), e102662. https://doi.org/10.1371/journal.pone.0102662

Meghwanshi, S. (2024). Harnessing artificial intelligence for enhanced vermicomposting. ResearchGate. https://www.researchgate.net/publication/379343806_Harnessing_Artificial_Intelligence_for_Enhanced_Vermicomposting

Nguyen, T. T., & Seddaiu, G. (2022). Integrated crop-livestock systems for nutrient recycling and soil regeneration. Agronomy for Sustainable Development, 42, 36. https://doi.org/10.1007/s13593-022-00781-8

Pathma, J., & Sakthivel, N. (2012). Microbial diversity of vermicompost bacteria that exhibit useful agricultural traits and waste

management potential. SpringerPlus, 1(1), 26. https://doi.org/10.1186/2193-1801-1-26

Pineiro, V., Arias, J., Dudu, H., Elverdin, P., Ibáñez, A. M., & Prager, S. D. (2022). From theory to action: Enabling the transition to sustainable food systems. Nature Food, 3(9), 670–678. https://doi.org/10.1038/s43016-022-00567-w

Regulation (EU) 2019/1009. (2019). Fertilising Products Regulation. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019R1009

UC Davis Agricultural Sustainability Institute. (n.d.). Closing the Loop. https://asi.ucdavis.edu

Inviting Contributions and Feedback

Join the PowerWORMS Community!

As we journey through the fascinating world of sustainable agriculture and vermicomposting, your voice, experiences, and insights are invaluable to us. We're not just a newsletter; we're a community of enthusiasts, learners, and eco-conscious individuals. And we'd love for you to be an active part of this vibrant community.

Share Your Experiences

Have you started your own vermicomposting project?

What challenges and successes have you encountered?

Do you have unique tips or stories about your vermicomposting journey?

We're eager to hear about your experiences! Your stories can inspire and educate others, creating a ripple effect of sustainable practices.

Ask Questions

Are there aspects of vermicomposting or sustainable agriculture you're curious about?

Do you have specific challenges you need help with?

Don't hesitate to ask. Our community is here to share knowledge and provide support.

info@powerworms.org

Interactive Community Section

Visit the PowerWORMS website https://powerworms.org and explore our new interactive community section. Post your stories, questions, and suggestions.

Stay Connected

Follow us on social media for updates, tips, and community highlights.

Share your vermicomposting photos and stories with the hashtag #PowerWORMSCommunity.

Your participation enriches our project and brings us closer to our goal of promoting sustainable practices worldwide. Together, we can make a significant impact on the health of our planet.

https://powerworms.org

https://www.instagram.com/power.worms/

https://twitter.com/power_worms

Looking forward to your valuable contributions!

Warm regards,

The PowerWORMS Team.

Prepared by the contribution of the partnership established under "Erasmus+ Program Key Action 2: within the Scope of Strategic Partnerships" project funded by Erasmus+ Programme of European Union

Grant Agreement No. 2021-1-TR01-KA220-VET-000030021

Contact Information

Name: Dr. Ekrem AKBULUT, Dr. Gulcin BEKER AKBULUT
Partner: Malatya Turgut Ozal University
Email: ekrem.akbulut@ozal.edu.tr, gulcin.akbulut@ozal.edu.tr

Name: Fatih DEMİRCİ, E. Ozkan DEMİRCİ
Partner: Naturainnova
Email: fatih.demirci@naturainnova.com, enezdemirci@gmail.com

Name: Abdullah ERDOGAN, Dr. Duygu Ozelci
Partner: Malatya Apricot Research Institute
Email: abdullah.erdogan@tarimorman.gov.tr, duyguozelci@gmail.com

Name: Chemi JOSE

Partner: WWOOF SPANJE

Email: info@wwoof.es

Name: Aikaterini SOTIROPOULOU
Partner: INNOPOLIS
Email: projects@innopolis.org

Name: Ljupcho TOSHEV, Aleksandra NİKOLOVA

Partner: FACE (Foundation Agro-Centre for Education)

Email: Lj.tosev@ace.org.mk, a.nikolova@ace.org.mk

Name: Athanasios KRİKİS
Partner: INNOTOMIA
Email: athkrikis@innotomia.com

Name: Sefer DEMİRCİ, Mehmet ALTUNBAS
Partner: ILA
Email: sefer@ilabour.eu, mehmet@ilabour.eu

This project has been funded with support from the European Commission. This publication is the responsibility of the project consortium. The Commission is not responsible for the use made of the information contained therein.

PowerWorms Project

Funded by the European Union

www.powerworms.org