

NATIONAL SYNTHESIS REPORT – SERBIA
Crop Protection, Pesticide Use, Agroecology and Stakeholder Interaction
COST Action CA21134 – TOP-AGRI-NETWORK | Virtual Mobility 2026

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The report was prepared through a compulsory national-level video meeting and a synthesis of material generated before and during the Virtual Mobility. The core online meeting took place on 4 September 2026 and brought together seven participants representing farmers, agricultural scientists, advisory services and agribusiness. As grantee I have coordinated and moderated the meeting. The discussion focused on crop protection practices, pesticide use, organic and low-input production, practical pathways toward zero-pesticide agriculture, and the transfer of knowledge from research to farm practice. This report also incorporates the experience of the Serbian COST National Workshop 2024 and a questionnaire completed by 67 workshop participants from that workshop. The consultation therefore combined expert discussion, farmer-oriented feedback and quantitative workshop evaluation. The purpose was not to produce a complete national inventory of every pesticide-related project, but to identify the dominant trends, practical constraints and the funding and cooperation mechanisms most relevant to a transition toward more preventive crop protection.

Questionnaire results from the workshop held in Serbia (2024)

Questions	% participants (n=67)	Interpretation
Prior familiarity with the zero-residue concept	52.2% yes; 29.9% partial	Most participants had at least some prior awareness.
Reaction to food above MRL	47.8% would stop using it; 52.2% would choose certified products	All respondents indicated a precautionary consumer response.
Food perceived as most risky for residues	Fruit 53.7%; vegetables 37.3%	Fresh plant products dominate perceived residue risk.
Importance of education on pesticide residues	98.5% very important	Strong demand for knowledge transfer and public/farmer education.
Workshop rating	Average 9.37/10	High satisfaction with the workshop format.
Interest in future workshops	100% yes	Clear basis for continued stakeholder interaction.

Situation of crop protection and pesticide use in Serbia

Crop protection in Serbia remains predominantly based on conventional chemical control, especially in intensive cereal, vegetable and fruit production. Organic and other certified or alternative production systems are present, but their share remains comparatively small. The regulatory framework is moving toward alignment with European Union requirements; however, field practice still frequently relies on routine pesticide treatments rather than decisions based consistently on monitoring, forecasting and economic thresholds.

Pesticide use according to FAOSTAT was reported at 2,519 t in 2020, 2,267 t in 2021, 2,288 t in 2022, 2,597 t in 2023 and 2,938 t in 2024. This corresponds to an increase of approximately 16.6% in 2024 compared with 2020 and about 13.1% compared with 2023. Herbicides increased

from 966 t in 2020 to 1,138 t in 2024, while fungicides and bactericides reached 1,182 t in 2024. These data underline that the transition cannot be measured only by the availability of alternative products; it requires changes in decision-making, advisory support and cropping-system design. Organic production is developing, but from a low base. In the VM presentation I have reported that the organic share of total utilised agricultural land of Serbia rose from 0.15% in 2010 to around 0.77% in 2022, remaining well below the EU-level ambition for substantially higher organic land shares. This gap indicates that Serbia has considerable room to expand organic, integrated and other low-input production systems, but expansion depends on economically viable farm models, credible certification, market demand and technical support.

Levers and barriers for wider use of agroecology and preventive crop protection

The national consultation identified four groups of barriers: economic, technical, regulatory and social. Economic barriers include higher initial costs, uncertain short-term returns and insufficiently predictable incentives. Technical barriers include gaps in farmer and adviser knowledge, limited access to specialised equipment and an insufficient range or availability of biological control products. Regulatory barriers are associated with slow or complex registration and administrative procedures, particularly for biopesticides and innovative alternatives. Social barriers include resistance to changing established routines and insufficient practical education. Participants emphasised that the central problem is not simply whether new technologies exist, but whether they can be applied reliably under farm conditions. The consultation therefore identified a set of priority levers:

- Stronger implementation of integrated pest management (IPM), with monitoring, forecasting, economic thresholds and treatment only when justified.
- Greater availability and practical validation of biopesticides, beneficial organisms and other non-chemical or reduced-risk alternatives.
- Wider use of resistant or tolerant varieties, crop rotation, diversification and other preventive agronomic measures.
- Precision agriculture and modern monitoring technologies that support timely, site-specific decisions.
- More field demonstrations, long-term trials and locally adapted evidence on agronomic and economic performance.
- Improved education of farmers and advisory services, supported by a larger pool of crop-protection specialists.
- More stable financial incentives and simpler administrative procedures for farms adopting preventive and agroecological approaches.

The agroecological approach was viewed as beneficial not only because it can reduce pesticide use, but because it can lower residues and exposure, protect biodiversity and beneficial organisms, improve soil and water management, increase crop resilience, rationalise inputs and strengthen long-term farm stability.

Projects and programmes funded in the domains of crop protection

The VM grouped national support into four operational pillars: organic production, integrated pest management, biological protection and education. These pillars are supported through a combination of national ministries, provincial authorities, research programmes, advisory structures and investment schemes. The materials specifically pointed to the Ministry of Agriculture, Forestry and Water Management, the Ministry of Science, Technological Development and Innovation, the Provincial Secretariat in Vojvodina, and investment/support

frameworks such as IPARD III. A recurrent weakness is the gap between pilot-project results and systematic farm-level adoption. Short-duration projects can demonstrate promising tools, but impact remains limited if financing, registration, adviser capacity and market incentives are not continued after project completion. Future calls and programmes would benefit from requiring demonstration farms, farmer participation, economic assessment and a clear post-project pathway for wider adoption.

National initiatives for interaction with stakeholders, especially farmers and policy makers

Stakeholder interaction is already occurring through university-led workshops, advisory services, producer associations, certification bodies, agribusiness, research institutions and public authorities. The National Workshop organised in Serbia provided a concrete platform linking these groups, while the Virtual Mobility meeting continued the dialogue at national level. The presentation also highlighted the importance of the Forecasting and Reporting Service for Plant Protection, which represents the type of monitoring and information infrastructure needed for preventive decision-making.

Five actions were repeatedly identified as necessary to accelerate the transition:

- Education: regular workshops, field demonstrations and practical training rather than information-only events.
- Participation: farmers should be partners in designing strategies, projects and support measures, not only end users.
- Advisory capacity: strengthen specialist advisory services and ensure that qualified advisers are geographically accessible.
- Organisation: involve producer associations as active intermediaries between farms, researchers, companies and authorities.
- Transparency: provide clear, easily accessible information on subsidies, calls, registration procedures and available technical support.

The questionnaire results strongly support continuation of this model: all 67 respondents wanted similar workshops in the future, and 98.5% considered education on pesticide residues very important. These findings indicate that stakeholder engagement should be treated as a permanent component of crop-protection policy rather than as a one-off dissemination activity.

Priority recommendations and conclusion

Serbia has a realistic basis for gradual reduction of pesticide dependency, but progress will depend on combining agronomic, economic and institutional measures. Priority should be given to measurable IPM implementation, stronger monitoring and forecasting, faster access to proven biological and reduced-risk products, expansion of resistant varieties and preventive agronomy, and more practice-oriented farmer education. Funding schemes should reward verified risk reduction and adoption of preventive measures rather than focusing only on equipment purchase or nominal reduction targets.

The national dialogue also shows that cooperation is a decisive enabling factor. Researchers need feedback from farms; advisers need continuous access to evidence and training; farmers need economically credible options; and policy makers need indicators that capture residues, exposure and environmental risk as well as quantities of products used. A coordinated framework linking these actors would make it easier to move successful pilot activities into routine practice.

This Virtual Mobility therefore fulfilled an important synthesis function: it combined scientific analysis, farmer and industry experience, survey evidence and policy-oriented discussion into a common national picture. The next step should be to maintain this network through follow-up

stakeholder workshops, stronger cooperation with farmer associations, regional comparison with neighbouring countries and continued exchange within COST Action CA21134. The overall direction is clear: sustainable crop protection in Serbia requires a shift from routine chemical control toward prevention, monitoring, diversified agroecosystems and shared decision-making.

