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Special Report | June - July 2023

From politics to practice: Paving a path to EU's pesticide ambitions

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How to make the target to slash in half the use and risk of chemical pesticides by 2030 a reality?

The EU has outlined the ambition to cut by 50% the use and risk of chemical pesticides in its flagship food policy, the Farm to Fork strategy, by 2030.

The move has proven contentious, with stake-holders questioning both the direction of travel and whether farmers have the tools to get there.

In this Special Report, EURACTIV takes a look at the innovations in the pipeline that could actually see this target play out in practice.

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Experts: Novel pest control solutions exist, but are 'stuck in pipeline'

By Natasha Foote | euractiv.com

Languages: Deutsch

[Shutterstock/Budimir Jevtic]

There are plenty of promising innovations which could help dramatically lower the use of pesticides, but these remain stuck in the pipeline, hampered by maladapted regulation and low confidence levels, scientists from leading research centre Rothamsted told EURACTIV.

The EU has outlined its ambition to slash in half the use and risk of chemical pesticides in its flagship food policy, the Farm to Fork strategy, by 2030.

The move has proven controversial, with stakeholders questioning both the direction of travel and whether farmers had the tools to get there.

But for Linda Field, a leading insect molecular biologist and professor emerita at Rothamsted, the longest-running agricultural research institute in the world, such targets can sometimes be a 'good thing' because "it galvanises things into action".

Stressing that the sector has made considerable progress over the past decade, the researcher told EURACTIV

that she is "quite optimistic that we will make quite big strides" over the coming years.

According to Field – who until recently led the research centre's Biointeractions and Crop Protection unit and has 45 years of research experience under her belt – the future of crop protection lies in a 'whole systems approach'.

Such an approach involves a combination of selective chemistry alongside more resilient crops, healthier biodiversity and a deeper ecological understanding.

"We're getting to the stage where we can develop chemistry that kills an aphid, but not a bee. It's more difficult, but it is doable," she said.

The research centre has no shortage of promising leads in the pipeline, from projects sequencing the genome of pests to identify species-specific target proteins, to LED beams which help accurately identify insect species for surveillance programmes.

"And, if these [innovations] all come through, it's kind of the opposite of a perfect storm, where everything goes wrong – I can see that could be a perfect summer's day," she said.

Plenty of potential stuck in the pipeline

However, such innovations often struggle to break through from research to the field, according to Rothamsted's Sam Cook, a behavioural ecologist who specialises in the development of ecologically-based tactics for integrated pest management (IPM).

Her research has a strong focus on using the natural enemies of crop pests that are "already out there in the environment", something she called a "big, untapped resource".

Despite this potential, alternative pest control methods "aren't really coming through and they're getting stuck in research labs", she said.

"There's all this pest control for free out there, and we're not using it properly for farmers," she said, lamenting the fact that there's "a lot in the research pipeline, but it's not getting out of the pipeline".

According to the researcher, regulation is a "big part of that".

"Companies are not willing to invest in alternatives because they know the regulatory process is so difficult and it's so expensive that it's probably not worth that investment," she explained.

For instance, one promising, targeted technology cited by the researcher is the use of RNA interference (RNAi). When taken up by pests, this initiates a cellular mechanism that uses the gene's own DNA sequence to silence certain genes.

But while the technology has demonstrable potential, it has been 'temporarily dropped' by many companies which "initially showed quite a lot of interest" – something Cook puts

down to maladapted regulation unable to cope with new innovations.

'Uneven' burden of risk

Meanwhile, both scientists noted that the burden of risk remains too firmly on the farmer's shoulders.

"There doesn't seem to be enough reward for those farmers that are carrying that risk and are trying to do the right thing, and that needs to change," Cook said.

She stressed that IPM is 'knowledge intensive' and that, as such, farmers require support to implement strategies at the farm level effectively.

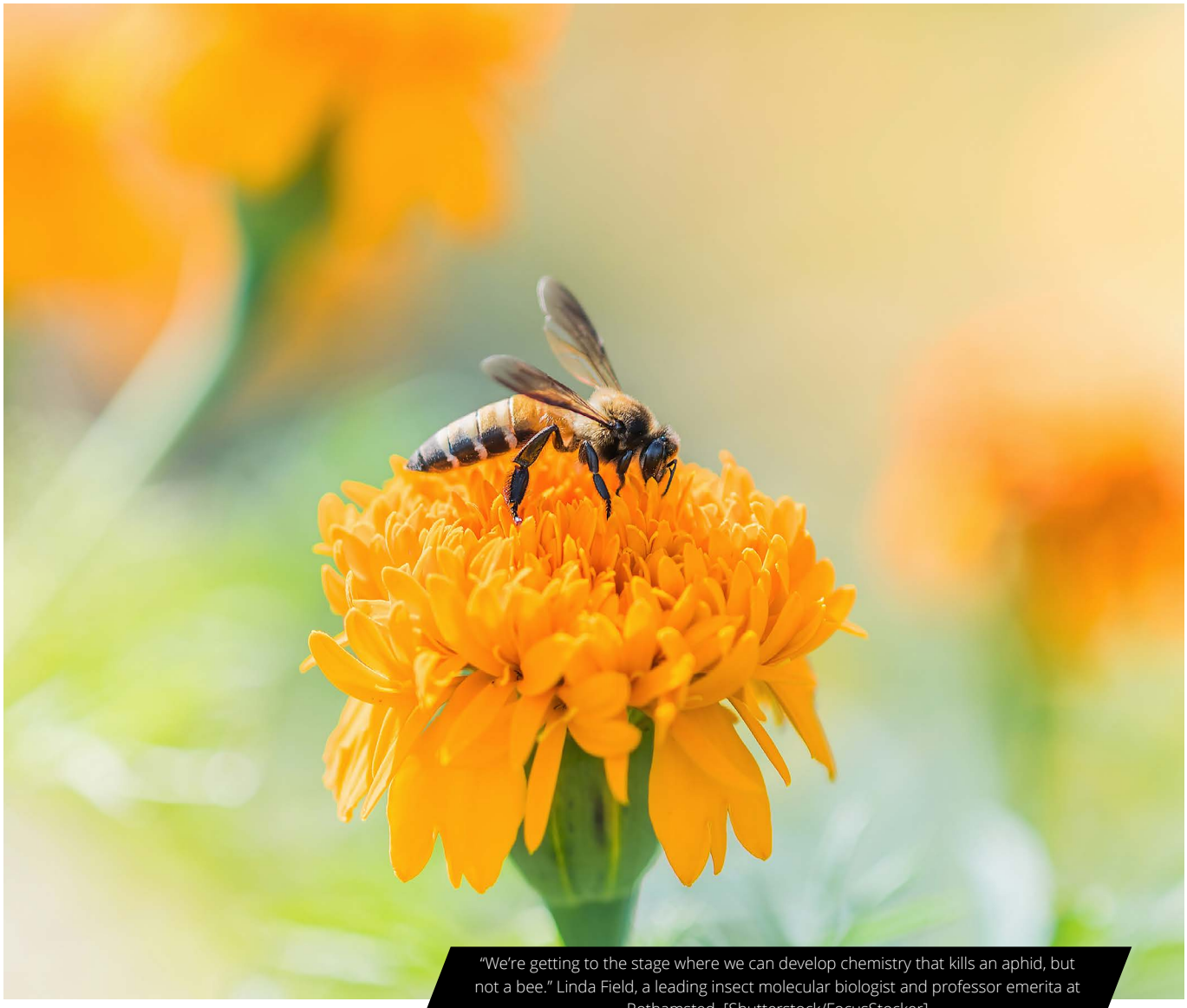
Likewise, Field noted that, as things currently stand, it "doesn't pay" for commercial advisors to recommend farmers to use 'riskier' alternatives because "if they don't work, it comes back on the advisor".

This encourages many to recommend spraying pesticides as it's "more certain and it's easier to do", she said.

"My feeling would be that, if [the EU is] really going to go for this [2030] target, we must try and build up confidence and types of alternative control," she said, stressing the need to "get farmers groups on board".

Likewise, the Commission acknowledged that "[a] key hurdle in the adoption of IPM [integrated pest management] and novel technologies is the uncertainty farmers face regarding their effectiveness and proper use," in a leaked impact assessment of the EU's plan to slash the use and risk of pesticides in half by 2030.

For this reason, the EU executive suggests the inclusion of farmers in supporting their confidence in the transition to more sustainable plant protection products.



"We're getting to the stage where we can develop chemistry that kills an aphid, but not a bee." Linda Field, a leading insect molecular biologist and professor emerita at Rothamsted [Shutterstock/FocusStocker]

Plant protection toolbox enriched through cutting-edge technologies

By Gerardo Fortuna and Julia Dahm | euractiv.com

AI technologies can help target herbicides, pesticides or fungicides [SHUTTERSTOCK/Scharfsinn]

A range of new technologies, from artificial intelligence to RNA-based innovations, could significantly reduce the amount of chemical pesticides used and yield new crop protection products.

In a proposal to revamp the EU's pesticide legislative framework, the European Commission has proposed to slash both the use and risk of pesticides in half by 2030.

Existing EU legislation, as well as national laws in many member states, already require farmers to follow the rules of Integrated Pest Management (IPM) – an approach to plant protection in which all other options, such as organic or physical plant protection methods, should be exhausted before resorting to synthetic pesticides.

While IPM means taking a systemic approach to reducing pesticides rather than focusing on a certain individual alternative or technology, a range of new technologies could be integrated into such an approach in the coming years and help achieve ambitious reduction targets.

On the one hand, this includes technologies that provide an alternative to synthetic products by protecting plants in ways that involve fewer risks or unintended side effects.

On the other hand, other technologies could help apply synthetic pesticides in a more targeted or effective way and thereby minimise the amount needed.

AI to help target pesticide use

Among the latter are AI technologies that help target herbicides, pesticides or fungicides to exactly those plants or areas of a field where they are needed.

"For weeds, this is fairly easy," explained German researcher Ralf Vögele, whose research focuses on

new approaches in plant protection.

"If I want to get rid of weeds in a normal arable crop, I only need a high-resolution camera and a proper, fast computer," he said.

An agricultural machine could then detect whether it has a crop or a weed in front of it and accordingly control a cultivator or hoe to destroy only the weeds.

However, when it comes to protecting plants against pests and diseases, using AI in a similar way is trickier, as they are less clearly visible, the researcher continued.

"We are currently working on large projects with the aim of being able to record the crop through other imaging techniques and then draw conclusions about whether it is healthy or not," he detailed.

"This is a challenge, to put it mildly."

Meanwhile, the amounts of data generated this way are so vast that humans cannot process them, according to Vögele.

"This means that we need to use artificial intelligence that we can train to detect which plants are healthy and which ones are diseased," he added.

While, currently, such applications are prohibitively expensive, according to the expert, this could change in the coming years.

Still, for Vögele, it is unlikely that every farmer could own such an AI-based system in the future. "I could imagine that, ultimately, contractors will offer this service," he said.

Designing new products

New technologies can also impact the developing phase of new crop protection products, aligning them with higher sustainability standards and levels of effectiveness.

In the past, the discovery process of new plant protection products usually started by testing substances against a leading library of small molecules.

Researchers were then looking for what experience thought they could have some potential for crop protection.

After these initial steps, some substance 'candidates' were considered for different use cases and different crops until the best one in terms of effectiveness and safety would have been eventually found.

New products are now designed using computation modelling, proprietary algorithms, and multi-omics techniques to take advantage of massive amounts of data through machine learning.

"These methods simply didn't exist when I started in crop protection chemistry," Axel Trautwein, head of regulatory science at Bayer, explained.

According to him, the new technology applied to research can create entirely novel crop protection solutions.

RNA, new genomic techniques: the way forward?

RNA-based technologies were widely used in COVID-19 vaccines and therapeutics, particularly the so-called messenger-RNA, a molecule containing instructions to cells involved in protein synthesis.

Researchers and private companies have started to investigate the full potential of RNA-based technologies to achieve chemical pesticide reduction targets and the protection of pollinators.

According to the annual sustainability report of GreenLight Biosciences, a public benefit corporation working on RNA-based biological alternatives, seven agriculture products of this kind could reach the market by 2026, subject to applicable regulatory approval.

The acceptance of RNA-based alternatives by regulators remains an open question as, for instance, they are still evaluated in the EU with a methodology tailored to chemical substances while being non-chemical.

According to German researcher Vögele, new genomic techniques (NGTs) could also provide a 'clear opportunity' for pesticide reduction.

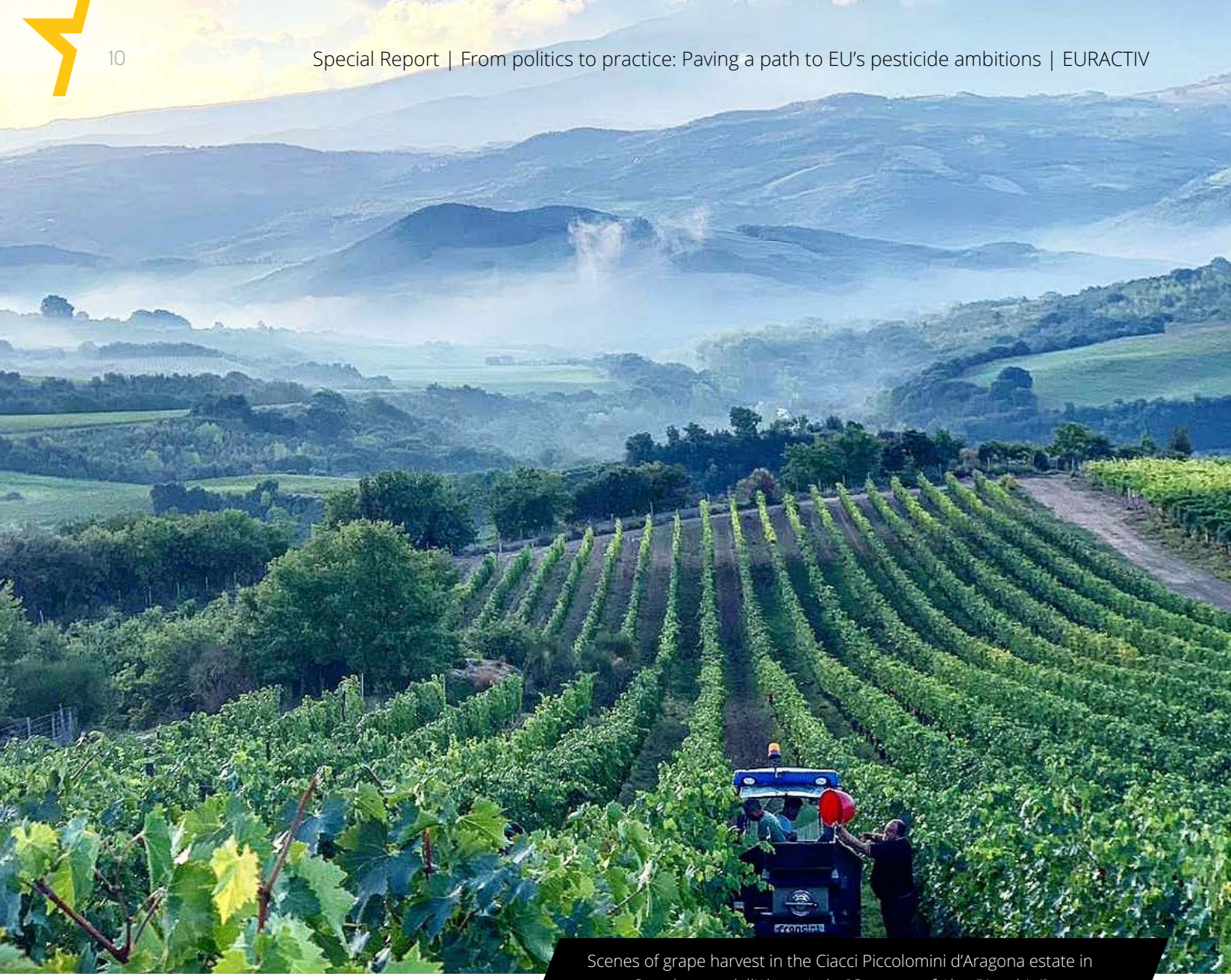
Through NGTs, certain characteristics of a crop, for example, its resistance to drought or disease, can be adjusted by targeting specific parts of its genome.

The researcher's argument also echoes comments made by several Commission representatives, including Vice-President Frans Timmermans, who suggested that the EU executive's proposals for pesticide reduction and the liberalisation of NGTs should be a package deal since they are intimately linked.

For the researcher, this provides an opportunity to better protect plants against diseases while minimising risks.

"We can modify things in a controlled way without unintended side effects. I think this is a huge opportunity," he concluded.

Following Image credit [Shutterstock/photostar72]



Scenes of grape harvest in the Ciacci Piccolomini d'Aragona estate in Castelnuovo dell'Abate, Italy. [Courtesy of Alex Bianchini]

Timing, monitoring key to sustainable farming, says winemaker

By Gerardo Fortuna | euractiv.com

Monitoring the spread of pests, conducting soil analyses, and learning how to intervene in plant health at the right moment are crucial in the switch to sustainable farming practices, an organic winemaker told EURACTIV.

The uptake of sustainable farming relies heavily on both the availability of solutions on the market and farmers' knowledge of new methods.

"It's definitely a different concept of agriculture, but a very action-oriented one," said Alex Bianchini, a third-generation winemaker from Italy, in an interview with EURACTIV.

Bianchini works in the family winery, which produces 300,000 bottles divided into eight different labels annually. Bianchini, along with his sister Ester, works alongside a team

of 22 others to do the work on the farm, run the warehouse where they organise guided tours and tastings, and keep up with administrative tasks.

Their estate, Ciacci Piccolomini d'Aragona, stretches for over 400 hectares in an area close to Castelnuovo dell'Abate, a small hamlet in the South-East of Montalcino municipality – a name that, for wine lovers, cannot be separated from its best product of this land, Brunello.

Roughly 90% of Bianchini's fields are planted with the large-berried Sangiovese vines, which produce the grape variety for the Brunello di Montalcino, one of the most beloved – and expensive – Italian wines.

"Every wine region in the world has its 'prince' grape and, obviously, Sangiovese is the master here," said Bianchini, who also grows Merlot, Cabernet, and Syrah varieties, as well as devoting 40 hectares of his family's land to olive groves.

Tradition in innovation

"Our climate allows us the conditions to do this type of farming," the winemaker said.

According to Bianchini, what makes the real difference in organic production when it comes to yield is the yearly weather patterns – for instance, consecutive dry seasons lead to lower yield, while on the contrary, regular rains allow for a bigger output.

Montalcino, which is host to some 250 wineries, of which roughly 60% are certified organic, is well-known for a certain richness in the differentiation of soils, as well as some very peculiar microclimates that make the Sangiovese grape variety, in particular, ripen well.

"Being in Montalcino, tradition is a cornerstone to be held firmly," said the winemaker, whose estate's origins date back to the 17th century with previous owners being direct descendants of Pope Pius II.

Bianchini also pointed out the 'luck' of having acquired knowledge of making wine from the previous generations of his family, therefore maintaining their tradition and know-how.

"However, innovations in the sector – a bit like the world – move forward rapidly, especially from a technological point of view, not only from a technical one," he said.

He mentioned the new tools at farmers' disposal to put into practice sustainable farming methods such as changes in weed control, whether manual or mechanical, or agricultural equipment allowing farmers to work the soil in the best possible way, as well as seed mixes that bring mineral and organic substances to the soil.

Time, the most important factor

Bianchini's family started implementing an integrated pest management (IPM) approach on their farms in 2015 and were certified organic, both for wine and oil production.

IPM is an ecosystem-based strategy that focuses on the long-term prevention of pests or their damage through a combination of techniques applied in an order of hierarchy in a way that minimises the use of chemical plant protection products to the greatest extent possible.

"It is a very different approach to farming compared to the conventional methods which are not always an absolute guarantee," he explained.

For instance, the winemaker makes use of biostimulants, which are substances or micro-organisms applied directly to plants to enhance nutrition efficiency in order to help with biotic and abiotic stress – which can also be seen as a protection against potential diseases and pests.

"Timing is an even more important factor than the product used to defend the plant," he said, explaining that knowing when to intervene with treatment is key.

"You can't always win the race against time, however, it always allows us to have results that, if done in the right way, are more than satisfactory," he said.

Know your soil

Climate change is the biggest problem for Bianchini, who said it prevents farmers from making long-term plans.

"Costs are sometimes higher [than with conventional farming] and we have to intervene more frequently to defend the plant," he said of sustainable practices, though added that this is a cost companies can budget for at the beginning of the year.

More unpredictable from a business perspective is the impacts of climate change, the winemaker said, saying that it necessitates additional monitoring through soil analyses.

"This certainly requires an extra effort, but it allows us to optimise a job that brings us, farmers, there in the fields from winter until the grape harvest," he said.

"Having knowledge of these aspects makes it easier to have an integrated, sustainable, organic farming approach," he concluded.

FAO official: EU shouldn't sacrifice food output in sustainability's name

By Gerardo Fortuna | euractiv.com

Languages: Deutsch

"The less Europe produce, the less it will export, and the more it will demand on global markets. This can increase tension," warned David Laborde, director of the agri-food economics division at the UN food agency (FAO). [Shutterstock/Konektus Photo]

Risking European agriculture productivity for sustainable farming goals may cause global tensions, as other countries cannot make up for the bloc's reduced output, says a United Nations (UN) expert.

The European Commission's Green Deal, including the 2020 Farm to Fork strategy, seeks to establish the EU's food system as a global sustainability standard. By 2030, the plan aims to halve pesticide use, cut fertiliser use by 20%, and dedicate a quarter of agricultural land to organic farming.

However, concerns about potential impacts on agricultural productivity and the EU's global leadership and trade relationships have arisen.

Europe needs to find a balance between its global and regional external action and its domestic sustainable agenda, according to David Laborde, director of the agri-food economics division at the UN food agency (FAO).

"I think the greening of European agriculture is very important. It's about sustainability, and we cannot sacrifice sustainability," he said.

"But it doesn't mean that Europe can sacrifice productivity either," he continued, adding that the issue at stake is how EU countries can get sustainable intensification gain and productivity at once.

For the UN official, the world could not do without Europe if the continent would give up on its role in the global supply and demand of agricultural commodities.

"The less Europe produce, the less it will export, and the more it will demand on global markets. This can increase tension," warned Laborde.

For this reason, the bloc has to face the tough task of finding the right "mix of domestic and global policy", which should also serve the EU to maintain its leadership on the world stage regarding food and nutrition.

Food 'insecurity' on the rise

Laborde was among the coordinators of the 2023 State of Food Security and Nutrition in the World (SOFI) report, published in July by the FAO and other 4 UN bodies – the World Health Organisation (WHO), the International Fund for Agricultural Development (IFAD), the World Food Programme (WFP), and the United Nations Children's Fund (UNICEF).

The report found that food insecurity – in the form of chronic hunger, undernourishment and malnutrition, particularly for children – is on the rise due to the COVID pandemic, several climate shocks, and local conflicts such as in Yemen, Syria, and Ukraine.

The 2023 edition of the study showed that there are also more food-insecure people in the UK and continental Europe, mostly due to economic crises and the increased cost of living.

"In the last three years, what we are seeing is rising food insecurity within European nations," said Laborde.

Food security is a concept carved into the EU Treaties and, together with farmers' income support, takes centre stage in the EU's main farming subsidies programme, the Common Agriculture Policy (CAP).

However, the concept takes on a different meaning these days. "When you are in Europe [and you are food-insecure], you don't fall into hunger, but you have to start to sacrifice what you eat in terms of quality rather than quantity," he explained.

The percentage of moderately or severely food-insecure people in Europe remains still below the threshold of 8% compared to more than 70% in low-income countries.

"Still, it's a relatively big increase for Europeans [compared to previous years]," he said. "It's not just something you see on TV, but people start to be concerned about that."

Markets and development aid

The EU's role in rebalancing the supply and demand of food should not be underestimated by the UN official, considering the level of uncertainty in agricultural markets.

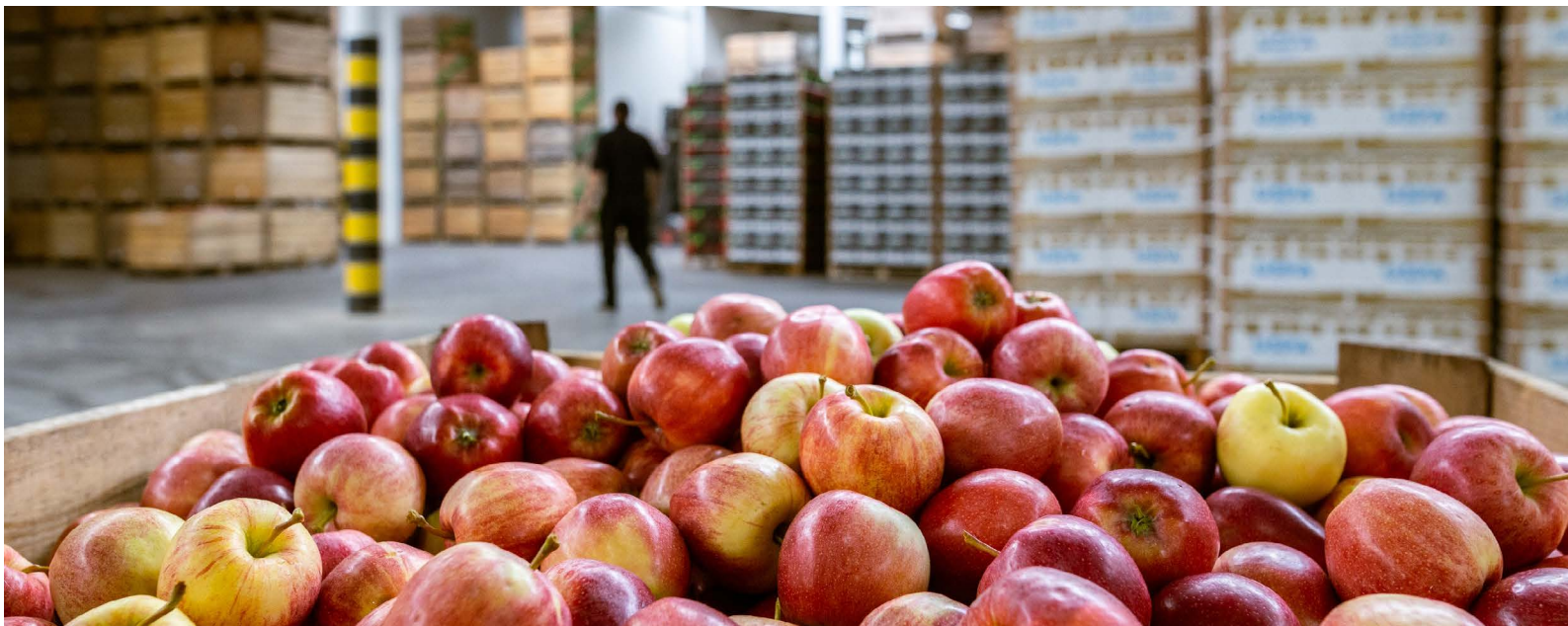
"The mission of markets is not to take care of the poorest. Thinking that markets are naturally going naturally to frame inequality and inclusiveness will be a bit naïve," he said.

In this sense, the sustainability aspects of farming become particularly relevant since many environmental externalities impact the price of agricultural commodities, Laborde stressed.

However, Europe is called on to maintain the same leadership as the world's largest donor in providing development aid.

"Europe is still playing a major role, and that's good. There's still a bit more to do," he concluded, referring to the relatively small amount Europe spends per inhabitant in aid to ensure global food security.

"Europe needs to find a balance between its global and regional external action and its domestic sustainable agenda, according to David Laborde". [Shutterstock/Sodel Vladyslav]



PROMOTED CONTENT

DISCLAIMER: All opinions in this column reflect the views of the author(s), not of EURACTIV Media network.

Time to put new tools into the farmer's toolbox

By Olivier de Matos | CropLife Europe

Olivier de Matos, Director General of CropLife Europe. Image provided by CropLife Europe.

Although my grandfather wasn't a farmer, he was someone who worked with his hands his whole life, as well as someone who used tools for his job. One of my most treasured possessions is his battered toolbox with its set of trusted old tools, many of which are still in perfect condition and which I still use today.

Olivier de Matos is the Director General of CropLife Europe.

I sometimes imagine what he'd say if he were still around, seeing the shiny new tools and technologies now available that could have made his life's work so much easier and more efficient. I also imagine what he'd say about farming today, in particular about how so many of the shiny new tools that have been developed for farmers are either way out of their price range, or that have been stuck for years in the EU's regulatory pipeline.

Given the challenges that EU agriculture is facing to transform the industry in record time, I am sure my grandfather would have had a 'salty' opinion about farmers not being able to access the tools available that would help them get the job done.

I firmly believe that innovation holds many of the answers to how we can address the challenges we face. Let me give three examples.

A digital future

First, the deliverables of Digital and

Precision Agriculture (DPA) are still significantly under-appreciated in the current Commission proposal, as well as in the draft from the European Parliament.

Agricultural innovation will be fundamental to delivering the European Union's flagship Green Deal. Our industry has committed €10bn to drive innovation in precision and digital technologies by 2030. We are already seeing how new technologies like digital farming are shrinking agriculture's ecological footprint. High-tech precision applications enable the delivery of the minimum amount of crop protection, in precisely the right place at exactly the right time. The latest harmonised risk indicator shows a trend of pesticide reduction use and risk of 21%. This proves that we are on the right track.

We are making these enormous investments because we believe in the future of agriculture. Moreover, by embracing the latest agricultural innovations and solutions, it will be possible to produce food for everyone – in Europe and further afield – in a more sustainable, less impactful way.

The proposed Sustainable Use of Pesticides Regulation (SUR) is key to enabling farmers to embrace these new and innovative tools. But it must be appropriately financed. European farmers and member states alone can't be expected to shoulder all the administrative and financial burdens resulting from the costs of implementing the proposed SUR.

Working with nature

Second, as part of our 2030 Commitments, CropLife Europe member companies are also investing €4bn into innovation in biopesticides. But financial investment alone is not enough. Farmers also need an enabling regulatory environment, as well as incentives, to ensure these innovative new crop protection solutions can be fully developed and deployed across the EU.

Biopesticides have many potential advantages. They are often less toxic to non-target organisms and the environment. They can also target specific pests, weeds or diseases, reducing the need for broad-spectrum chemical pesticides. And they break down more quickly in the environment, reducing the potential for long-term residues.

When used as a component of Integrated Pest Management (IPM) programmes, applying biopesticides helps to deliver economically viable crop yields while reducing the overall use of chemical pesticides. Farmers can unlock the power of these innovative new products by incorporating them into their pest management strategies, using a combination of different biopesticides to target specific pests, applying them at the appropriate time and in the correct manner, and monitoring the results to ensure their effectiveness.

Before they can do so, however, the crop protection sector needs the EU institutions to ensure the regulatory framework helps our industry to bring new biopesticides into the European marketplace. The European Commission urgently needs to develop data requirements for novel biopesticides. Exciting new technologies such as peptides and fermentation products are being developed, but because of the lack of a clear regulatory pathway, these new innovations are not reaching the EU market. Applicants are uncertain about how to secure registration in Europe and EU farmers suffer as a result because they are at a competitive disadvantage compared to other global regions.

Innovation in plants

Third, the EU's current regulatory framework for New Genomic Techniques (NGT) products is not fit for purpose. The existing rules are hindering the development and availability of NGT products for European farmers, and they are also negatively impacting EU innovation and competitiveness. Other regions of the world are forging ahead; Europe is lagging behind.

Plant breeding is as old as agriculture itself and farmers and scientists have long used many different plant breeding techniques to make use of a plant's natural genetic diversity to produce plants with beneficial characteristics. Today's innovation in plant breeding and plant biotechnology allows us to pinpoint specific changes in a plant and efficiently develop new varieties with targeted desirable characteristics, such as increased productivity, resistance to disease, drought tolerance, longer shelf life and improved taste.

In July, the European Commission is expected propose a new legal framework for plants obtained by targeted mutagenesis and cisgenesis and for their food and feed products. This new framework must be non-discriminatory and apply the same regulatory oversight to similar plants, taking as the basis the regulatory system for conventionally-bred plants; it should be based on a plant's characteristics, rather than the technique used to generate it; and it must be based on science, as well as future-proof to accommodate continuous scientific progress.

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