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BUILDING RESPONSIBLE GLOBAL VALUE CHAINS FOR SUSTAINABLE TROPICAL FRUITS



Opportunities for the tropical fruit sector to meet European Union regulations on maximum residue levels and pesticide use

As the second largest importing market for tropical fruits, the European Union presents immense business opportunities for actors in these value chains. The tropical fruit sector plays an important role in meeting the increasing demand for nutritious fruits within the European Union (EU). However, tropical fruit producers and exporters face challenges in complying with new and anticipated sustainability regulations related to the European Green Deal and the EU's <u>Farm to Fork Strategy</u>, including stricter regulations on maximum residue levels (MRLs). MRLs refer to the maximum allowable levels of pesticide residues permitted in or on food or feed when pesticides are applied correctly. These regulations are established to ensure food safety and protect consumer health. As the European Union steps up its ambition for more sustainable production and reduced dependence on synthetic inputs, MRLs are set at the lowest limit¹, impacting tropical fruit exporters and producers.

Producers and exporters of tropical fruits are faced with a dilemma. In the past decades, the use of pesticides has helped them ensure a consistent supply of products for domestic and export consumption. Agrochemical use has been particularly important for effectively managing pests and diseases that damage tropical fruits, causing production and post-harvest losses, and reducing revenues. Now and under projected future production conditions, rising temperatures and variable precipitation associated with climate change are creating an environment for increased pests and diseases in many producing countries. This may lead some producers to consider expanding agrochemical use. At the same time, market regulations are striving for reduced pesticide application through lower MRLs. To maintain access to important export markets such as the European Union, producers must find ways to control pests and diseases while proactively working to reduce pesticide use.

MRL limits apply to over 300 fresh products, as well as to the same products after processing. These limits are adjusted to account for dilution or concentration during the transformation process. The lowest limit of analytical determination (LOD) is set at 0,01 mg/kg in EU law where a pesticide is not specifically mentioned. For more information, refer to the <u>European</u> <u>Commission webpage</u> on MRL.

This brief discusses anticipated reductions in MRLs and pesticide use requirements in the European Union. It also gives examples of good practices to help the industry adapt and comply with these evolving regulations. Compliance with stricter MRL and pesticide regulations helps to maintain access to the European Union market, enhances competitiveness, strengthens consumer confidence, and reduces reliance on expensive synthetic inputs, increasing sustainability.

Sustainability challenges posed by agrochemical use

While the tropical fruit sector is working to adopt sustainable production practices, many producers still rely heavily on chemical pesticides and fertilizers to ensure consistent production for export and domestic consumption. However, the inadequate or excessive use of such agrochemicals comes with a cost. The following section identifies challenges that may arise from the use of agrochemicals across the three dimensions of sustainability.

Economic challenges

Production costs: Reliance on petrochemical-based pesticides contributes to high production costs. Pesticides and fertilizers can be expensive inputs for agricultural producers, especially if they need to be applied frequently or in large quantities. Climate change is also expected to increase the need to use pesticides, whether chemical or biological, and other methods to manage pest and diseases more effectively.

Rising fossil fuel prices have directly affected the costs of petrochemical-based pesticides and thus, production costs for tropical fruits. In times of high input prices many producers also use older, generic pesticides that are no longer under patent. While these may be less expensive than modern patented pesticides, they can be highly hazardous for humans and the environment. Many of these are also no longer permitted in large import markets. These economic challenges are particularly serious for small-scale farmers who may struggle to afford inputs and cannot afford to invest in research in or adoption of more sustainable solutions.

Market access: Stricter regulations on agrochemicals and MRLs could create additional barriers to trade and market access. A lack of tailored resources and advisory services on MRLs for the tropical fruit industry may also limit the capacity of producers and exporters to understand how regulations apply to them and what alternatives are available to chemical pesticide use. Furthermore, policy and legal systems in many exporting countries do not allow for the speedy authorization of alternatives to those pesticides soon to be prohibited in the European Union. The limited number of authorized options to manage pests and diseases complicates compliance efforts to obtain market access.

Environmental challenges

Natural resource degradation: Excessive or improper application of agrochemicals can lead to environmental pollution. Pesticides and fertilizers can leach into the soil and contaminate groundwater, rivers and other water bodies, with detrimental impacts on terrestrial and aquatic ecosystems. Chemical runoff can pollute fresh water, putting human and animal health at risk. Additionally, some agrochemicals may persist in the environment for extended periods, further exacerbating their negative impacts on soils, production quality and climate change through the release of greenhouse gas emissions after their application.

Biodiversity loss: Agrochemicals can be harmful to local fauna and beneficial organisms, including pollinators that play an essential role in the production of many fruit crops. Pesticide exposure can lead to declines in pollinator populations, reducing crop yields. This can have cascading effects not only on agricultural productivity, but also on the entire ecosystem health.

Social challenges

Human health and occupational safety: Farmers and workers may experience acute or chronic health issues when they come into direct contact with agrochemicals in the field or in post-harvest processes. Farmworkers are particularly susceptible to pesticide exposure if proper safety measures are not followed. These measures should include the utilization of personal protective equipment, adherence to safety protocols and comprehensive training on agrochemical application and disposal. Failure to observe these precautions can lead to accidents and even death. Consumers can also be exposed to dangerous levels of pesticide residues if MRLs are exceeded. Ensuring the safety of agrochemical use is thus crucial for protecting human health throughout the value chain.

Evolving European Union regulations on reduced use of agrichemicals and lower maximum residue levels

The European Union has been progressively strengthening regulations related to the use of agrochemicals. The aim is to reduce the environmental and health impacts associated with agrochemical use while ensuring the production of high-quality, safe food for consumers.

Under the Farm to Fork Strategy specific targets have been set to reduce the overall use and risk of chemical pesticides in the European Union. By 2030, the European Union aims to achieve a 50 percent reduction in the use of chemical pesticides. The strategy also promotes organic farming practices.

In relation to MRLs, the European Union has been working towards establishing stricter standards based on scientific assessments, taking into account data on pesticide residues, toxicology and dietary exposure. The European Union does allow exporters to request "import tolerance" MRLs that allow continued exports even where the pesticide is not used in the European Union. Such a request can take time, be costly for exporters and may not be granted. (See AGRINFO <u>Pesticide residue import tolerance MRLs explained</u>.)

Practical options for the tropical fruit sector to comply with European Union requirements

Complying with new European Union requirements can be expensive for businesses in the short term, as it may require adjustments to production methods, investments in new technologies and training, as well as time and effort to obtain the information necessary to keep up to date with evolving regulations. In some cases, companies might need to obtain third-party certifications for market access. This can be particularly difficult for small-scale producers and companies with limited financial capacity. However, transitioning production to the new requirements will help to maintain market access and provides an opportunity to adopt more sustainable and environmentally friendly approaches, making value chains more resilient in the long term. At the same time, embracing sustainable cultivation practices and taking steps to manage plant pests and diseases and meet crop nutrition requirements in alternative ways will reduce reliance on expensive agrochemicals. While initially this may seem overwhelming, it can increase profitability and business performance in the medium term.

Tropical fruit industry actors can consider a mix of agronomic and non-agronomic options as they make plans to comply with the new requirements. Some options are introduced below. Additional details can be found in the "Resources" section of this brief and the Responsible Fruits Project's forthcoming technical guides on climate change adaptation in the tropical fruit sector.

Adopt integrated pest management

Integrated pest management (IPM) is an approach to manage pests and diseases that minimizes reliance on chemical pesticides. IPM combines various techniques, including the use of biological agents, crop rotation and association, and mechanical methods, to manage pest populations. A key feature of IPM is the regular monitoring of plantations and orchards to ensure early detection of pests and diseases and changes in their levels. Monitoring must be accompanied by the correct knowledge and identification of pests, diseases and weeds that may harm fruit production, as well as the beneficial plants and insects that could help combat the pests. This is a key component for improving the resilience of the production system.

By adopting IPM practices, tropical fruit producers will be able to reduce their use of expensive or outdated and highly hazardous agrochemicals and increase their capacity to comply with new market requirements.

Use organic fertilizers and biofertilizers

Organic fertilizers and biofertilizers can be used to reduce reliance on chemical inputs and to improve crop and soil nutrient management. These options can enhance soil health and crop performance, while helping plants cope with harsh conditions like lack of water, high salt levels and harmful chemicals. In some cases, the combination of herbicides with inorganic fertilizers and heavy metals can stimulate the presence of harmful organisms. Ultimately this will also reduce applications of synthetic compounds.

The most common organic fertilizer in fruit production is compost derived from agricultural residues, and livestock and household waste. In some cases, compost may increase productivity more than synthetic fertilizers. Compost is well suited to rehabilitating degraded soils and combating erosion and salinization.

Biofertilizers are natural substances containing living organisms like bacteria, fungi and algae. These microorganisms have beneficial effects on plants by helping them grow better, capturing nitrogen, and making iron and phosphorus more readily available in the soil for plants to use. Biofertilizers are yet to be widely adopted or authorized for use.

Proper preparation, application and safety measures are crucial when applying both organic fertilizers and biofertilizers. Farmers should be well-informed about appropriate usage with respect to soil properties, crop nutrition requirements, application rates and potential of GHG emissions in order to maximize their benefits and minimize potential risks.

Harness precision agriculture and innovation

Technology and data-driven approaches to tropical fruit production, such as remote sensing and variable rate application of inputs, enable precise input use, reduction of waste, and increase overall efficiency. An example of this is fertigation (see below). The use of drones can also help to collect data for analysing individual plant health, optimizing irrigation and input applications, and to detect pests early.

Combine irrigation and application of fertilizers

"Fertigation" is an irrigation method that combines the application of water and fertilizers to enhance nutrient delivery to plants. This technique improves fertilizer efficiency, leading to reduced fertilizer usage. By providing more precise control of nutrient application, fertigation prevents nutrient runoff, positively impacting soil health, fruit quality and production costs. It also enables water savings by improving efficiency.

Apply organic soil mulching

Organic soil mulching involves spreading organic material, such as crop residues, leaves, grass or branches, over the soil. The practice helps to retain soil moisture, suppress weed growth and improve soil structure, thus reducing the need to apply chemical pesticides and fertilizers. The cost of using organic mulches tends to be low as the materials are cheap and locally available.

Diversify crops in orchards and plantations

Crop diversification, through practices such as intercropping and agroforestry, is a powerful option to minimize the spread of pests and disease outbreaks and to address soil degradation trends found in large monoculture systems. It enhances the biodiversity present in the production system, including the soil, and disrupting the life cycles of crop-specific pests and diseases. Crop diversification may also create additional benefits such as income diversification and food availability.

Intercropping can provide repellent and attractant plants, shelter to natural enemies of pests, and nutrient enrichment to the soil. In the case of agroforestry, production of plants is combined with trees and shrubs. This has been shown to increase soil stability, prevent erosion, sequester carbon and offer shade and windbreaks to other crops or trees.

Grow cover crops

Cover crops are a form of crop diversification but are mainly grown to offer soil cover and/or nutrients to the main crops and to the soils. These crops can be grown during the off-season or intercropped with the main cash crop. The use of cover crops can improve soils, manage soil nutrients, suppress weeds and pests, conserve moisture and enrich biodiversity including soil-dwelling natural enemies that regulate pests.

Comply with relevant voluntary sustainability standards

Some voluntary sustainability standards and certification schemes incorporate legal requirements for compliance with MRLs and pesticide use. Thus, compliance with such standards and certification can demonstrate to buyers and consumers compliance with legal requirements. Producers should consult with the voluntary sustainability standard certification bodies in their country to inquire how the certification schemes are incorporating new regulations into their standards.

Cooperate across the value chain

Due to the complexity and pre-competitive nature of the requirements on MRLs and pesticides, avocado and pineapple industry actors may consider cooperating along their value chains at the global or national levels. The benefits of such multistakeholder initiatives include the exchange of knowledge and expertise, capacity development, and partnership opportunities to address sustainability risks, enhance resilience and adapt to new MRL and pesticide requirements.

Stay informed and seek support

Regular monitoring of pesticide approval and MRL updates is essential. It is expected that small-scale producers and small and medium enterprises have less resources to ensure compliance with regulations. Such actors may seek assistance and advice from their governments, producer associations, larger companies, research institutions, civil society and international organizations. The European Commission keeps a publicly available database on <u>MRLs</u> on its website about <u>food safety</u>. The <u>AGRINFO</u> database can also be used to track rule changes in the European Union. The <u>Committee Linking Entrepreneurship</u> <u>Agriculture - Development (COLEAD)</u> Committee Linking Entrepreneurship Agriculture Development (COLEAD) can be contacted for guidance on meeting evolving requirements.

Conclusion

Complying with stricter regulations for MRLs and pesticide reduction is crucial for tropical fruit producers and exporters targeting the EU market. The challenges related to agrochemical use and MRL compliance demand an integrated approach, requiring changes in fruit production practices and processing and increased collaboration among different actors. Adapting to the evolving regulations will secure the longterm success of the tropical fruit industry in the EU market and contribute to the development of sustainable and more resilient food systems. Compliance with EU regulations may also provide an advantage when other markets increase their focus on sustainable production and will reinforce the tropical fruit sector's commitment to sustainability and responsible business conduct practices.

Resources

Agrinfo. https://agrinfo.eu/

Codex Alimentarius Commission. 2023. Codex Maximum Residue Limits (MRLs). http://www.fao.org/fao-who-codexalimentarius/standards/pestres/pesticides/en/

Committee Linking Entrepreneurship Agriculture Development (COLEAD). https://www.colead.link/

European Commission. 2023. Farm to Fork Strategy. https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

European Commission. 2023. MRLs.

https://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/start/screen/mrls

FAO. 2023a. Resilience assessment of avocado and pineapple value chains.

https://doi.org/10.4060/cc5967en

FAO. 2023b. Technical guide #2: Climate Change Adaptation [Links to be inserted when published]

FAO. 2023c. Webinar #13: How can the European Green Deal drive sustainability in the tropical fruit sector?

[insert link when published]

FAO.2023d. Integrated Pest Management. https://www.fao.org/pest-and-pesticide-management/ipm/integrated-pest-management/en/

FAO. 2023e. TECA - Technologies and Practices for Small Agricultural Producers.

https://teca.apps.fao.org/teca/en/about

FAO. 2022. Webinar #5: Reduction of agrochemical use, sustainable pest and disease management and compliance with MRLs.

https://www.fao.org/3/cb9092en/cb9092en.pdf

UCANR (University of California Agriculture and Natural Resources). 2023. Statewide Integrated Pest Management Program.

https://ipm.ucanr.edu/

World Agroforestry (ICRAF). https://www.worldagroforestry.org/

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