5(b). Climate change – impacts on nuts and dried fruit quality

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Impacts (1/2)

- Drought and heavy rains –quality issues and shrinked kernels.
- Cold, even during spring, in the Northern and Southern hemispheres.
- Loss of fresh fruit, which impacts dried fruit supply.
- Devastating earthquake in Türkiye and Syria and subsequent heavy rains affected the apricot producing region of Malatya, causing a widespread *Monilinia* fruit disease and collapsing the supply chain for four months.

Impacts (2/2)

Some specific ways in which climate change may impact nuts and dried fruits are:

- Mycotoxin contamination
- Nut/fruit size
- Nut/fruit flavor and aroma
- Nutritional composition
- Allergenic potential

Sources:

- Zingales, V., Taroncher, M., Martino, P. A., Ruiz, M. J., & Caloni, F. (2022). Climate Change and Effects on Molds and Mycotoxins. *Toxins*, 14(7), 445.
- Beggs, P.J., Walczyk, N.E. Impacts of climate change on plant food allergens: a previously unrecognized threat to human health. *Air Qual Atmos Health* 1, 119–123 (2008). Report of the Scientific Committee of the Spanish Agency for Food Safety and Nutrition (AESAN) in relation to the effects of climate change on the presence of mycotoxins in food
- Richard D Semba and others, The Potential Impact of Climate Change on the Micronutrient-Rich Food Supply, *Advances in Nutrition*, Volume 13, Issue 1, January 2022, Pages 80–100.

Solutions

- Implementing sustainable agricultural practices
- Adapting to changing climate conditions
- Improved pest and disease management
- Investing in research and development of climate-resilient varieties
- Knowledge sharing and capacity building
- Policy support and market incentives

Addressing climate change requires a comprehensive approach that involves multiple stakeholders, including farmers, researchers, policymakers, and consumers.

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Advances in the nut & dried fruit sector (1/3)

Development of new varieties:

- More productive
- More resistant to plagues, diseases, drought…
- Self-pollinated
- Reducing the time needed for trees to bear fruit (by grafting)

Advances in the nut & dried fruit sector (2/3)

Spatial mapping of orchards:

- Crop acreage and age determinations
- Surface and groundwater modeling and assessments
- Groundwater recharge enhancement
- Evapotranspiration estimation and models
- Drought and climate impact analysis
- Water use efficiency and water infrastructure

Smart farming:

- Digitalization and smart technologies
- Optimizing fertilizer and plant protection products applications
- In-field real-time monitoring tools

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Advances in the nut & dried fruit sector (3/3)

Irrigation:

- Microirrigation (microsprinklers or drip)
- Subdripping irrigation
- Demand-based irrigation
- Monitoring real-time weather
- Responsible irrigation decisions

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THANK YOU