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Editorial

Effects of Agronomical Practices on Crop Quality and Sensory Profile

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1. Introduction

In 2015, the 2030 Agenda for Sustainable Development adopted 17 Sustainable Development Goals (SDGs), with the aim of "peace and prosperity for people and the planet" FAO [1]. Most of them are directly or indirectly related to this Special Issue, such as the following goals: (i) **no poverty**, including the lack of food, clean drinking water, and sanitation; (ii) **zero hunger**, including food security and improved nutrition and promoting sustainable agriculture; (iii) **clean water and sanitation**, including the availability and sustainable management of water; (iv) **industry, innovation, and infrastructure,** including sustainable industrialization and technologies; (v) **climate actions**; (vi) **life on land**, which includes the protection and promotion of the sustainable use of terrestrial ecosystems, while also working to avoid desertification, land degradation, and biodiversity loss; and (vii) **technology related** to agrifood systems [1]. However, many challenges, such as the pandemic situation (COVID-19), intensification of conflicts, economic slowdowns, and, predominantly, climate extremes, together with rapid population growth and changes in consumption patterns, are slowing down the progress in these areas. According to FAO [2], our agrifood system is both contributing to and affected by extreme weather events, land degradation, and biodiversity loss.

In this context, the present SI was released to address different topics that can contribute to fighting these challenges and meeting these objectives. As mentioned in the SI description, agronomical practices have focused on increasing the total crop production and general quality of products. However, currently, a more direct approach that considers technological behavior and sensorial characteristics is feasible. Climate change has led growers to change their agricultural practices and develop smart agriculture strategies to achieve improved and unprecedented control of fruit production. In addition, consumer behavior has evolved rapidly in the last few years, leading to more responsible purchases of organic, local, traditional, and sustainable, as well as healthy and tasty, food products. Overall, these aspects require continuous research in the field, and the aim of the present Special Issue is to present the latest findings in the agronomy field, including fruit quality, processing aptitude, and sensorial properties. New approaches to transcriptomics and the environment–gene and expression–food properties relationships are of particular interest.

The first edition of this SI published relevant research in this context, which was related to different crops such as tomato, almonds, mandarins, lemons, prickly pear, table grapes, fingerroot, apples, olives, and extra virgin olive oil (EVOO). The publications in the present SI are mainly research articles providing novel information about growing conditions, cultivars, origin, irrigation strategies, trellis systems, pre- and postharvest treatments and their effect on the fruit's quality, economic water productivity, and consumer acceptance.

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The authors also highlighted the importance of breeding programs on the development of cultivars that meet the climatic conditions and fulfill consumer preferences.

Two works focusing on tomato crops were published in this SI. The authors Felföldi et al. [3] investigated the behavior of four commercial tomato hybrids(two newly created and two that were used as controls in the breeding process), cultivated in a high plastic tunnel, in terms of the physicochemical and sensorial parameters of their tomato fruits. Meanwhile, Cammareri et al. [4] presented relevant results about the geographical conditions that impact tomatoes' quality and consumers' acceptance of tomatoes. In the former study, the authors reported that the new commercial hybrid registered the highest values for carotenoid total ascorbic acid, while the highest total acidity was recorded in the control sample. The authors concluded that the new commercial hybrids exhibit some traits of agronomic interest better than the control samples do, with similar commercial and sensory qualities. Moreover, the authors considered the analyzed components to be essential to determine the quality of tomatoes and their use in the obtention of new cultivars when anticipating the new requirements of fresh tomatoes and consumer demands. The latter study evaluates the behavior of two tomato cultivars, 'Piennolo' and 'Penjar-Ramellet', grown in Italy and Spain. The main conclusion of their study was that both cultivars lost their corresponding peculiar phenotypes in terms of their physicochemical properties and postharvest behavior when not grown in their original agro-environmental conditions. What was interesting in their study was that none of the cultivars fulfilled the consumers' preferences, which led them to the conclusion that there is an important need to develop breeding programs to obtain tomato genotypes that are accepted by consumers. In this sense, authors from the CIAGRO-UMH Tomato Breeding Group developed different hybrids with genetic resistances to viruses and most of the original 'Muchamiel' genome and analyzed different quality parameters to determine which was a sensory analysis [5]. This tool, together with other quality parameters, helped them conclude that a Muchamiel/Beaufort combination could be suitable under unfavorable conditions, because this combination did not affect the yield and maintained its quality and sensory traits the best. On the other hand, the authors reported that Maxifort grafted plants did not seem to provide agronomic or quality/sensory benefits.

Three manuscripts that were published in this Special Issue were related to **citrus fruits** such as mandarin, pigmented mandarins, and lemon [6–8]. The communication related to **mandarins** was focused on late-season cultivars ('Afourer', 'Tango', and 'Orri') of mandarins grown in Spain, because they represent an important economic value due to their high production out of season. Maciá-Vázquez et al. [6] reported that the morphological characteristics were 20% higher for the 'Afourer' cultivar, which was more orange in color and contained more juice than the others. The 'Orri' cultivar was found to be 18% higher in sugar concentration, while 'Tango' mandarins cultivated on two different rootstocks presented 28% more phenols than mandarins from an FA rootstock did. The other study, which is about the acceptance of new **blood mandarins**, used 800 consumers from Spain and Italy, with and without information about the health properties of the anthocyanins that are responsible for red pulp coloration [7]. Giménez-Sanchis et al. [7] reported relevant results on consumer behavior in different countries regarding pigmented mandarins. For instance, the authors reported that Italians were more willing to accept new mandarin cultivars than Spaniards, because they are more familiar with blood oranges. Both slightly and medium-pigmented mandarins were well accepted in Italy, while Spanish consumers preferred the slightly pigmented cultivar. The most intensely pigmented mandarins were not well accepted in either country. The authors reported that health-related information had a positive effect on Spanish consumers but did not modify the attitudes of Italians. These results are of the utmost importance and highlight the importance of knowing consumer preferences before commercializing a new product in each region. Furthermore, it shows that positive information can change the opinions of Spanish consumers, who are not used to this type of mandarin, on this new breed. Finally, the last study on citrus fruits was related to the physiological and agronomic responses of two irrigation systems in **lemon**

trees, (i) a conventional design (2 L, two drip lines with six drippers per tree) and (ii) a design with a larger wetted surface (3 L, implementing the conventional design with a third drip line and nine drippers per tree), applied to 'Fino 49' lemon trees [8]. Robles et al. [8] reported that the use of an irrigation design with three lines of emitters (3 L) promoted a better distribution of water in the soil profile, which led to an improvement in certain gas exchange parameters, such as the stomatal conductance, which resulted in (i) a reduction in the number of fruits affected by the physiological disorder known as Endoxerosis and (ii) and an increase in the precocity of the harvest. The authors also concluded that the installation of a third drip line allowed for the economic water productivity to be increased.

Sastre et al. [9] also studied the influence of irrigation strategies but on **olive** crop yield and **EVOO** quality. The authors reported that the edaphoclimatic conditions of an olive orchard have a higher impact on olive fruits' quality parameters than the irrigation treatment does. Regarding the irrigation strategy, the regulated deficit irrigation treatment (with the application of 40% of the water needs after massive pit hardening during phase II of growing the fruit and 100% during the rest of the year, in five different locations of central, eastern, northeast, and northern of Spain) is an interesting irrigation management, because it contributes to water saving (more than 20% on average) while maintaining the crop load and olive oil quality. The authors also revealed that the most sensitive compounds to this irrigation strategy were some sterols (campesterol and apparent β-sitosterol), triterpenic dialcohols, and most of the fatty acids, but with differences in the low magnitudes.

Another publication in this SI highlighted the importance of an appropriate grapevine trellis system for **table grapes** for regulating vine vigor, impacting grape yield and fruit quality, and achieving labor-saving field management. The study was carried out in the North China Plain, and the trellis systems consisted of (i) a T trellis, with shoots positioned horizontally and downwards, and (ii) a V trellis, with shoots positioned upright with an inclined angle. Wang et al. [10] reported that due to the structural characteristics of the T trellis and effective vine vigor regulation, the apical dominance of grapevines grown under the T trellis was reduced, and the microenvironment around and inside the canopy was optimized. The authors concluded that the 'Eurasian' table grape cultivars grown under the T trellis system showed a manageable vine vigor, more consistent shoot growth, better fruit quality and taste, and greater accumulation of polyphenolic compounds and monoterpenes compared to the V trellis system.

Tomala et al. [11] assessed the quality of 'Red Jonaprince' **apples** during storage after delayed harvesting and 1-methylcyclopropene (1-MCP) preharvest and postharvest treatment for different storage times. To determine the physiological state of the apples during harvest, their starch index and Streif index, internal ethylene content, firmness, soluble solids content, and titratable acidity were evaluated. The authors highlighted that in the case of delayed harvesting, the application of 1-MCP is recommended both in postharvest and preharvest, because it assures a stable firmness and soluble solids, which do not decrease during storage and shelf life.

Thomya et al. [12] presented remarkable results related to the relationship between the phenotypes and chemical profiling of ***Boesenbergia rotunda*** collected from different habitats of northern Thailand. The authors explained that *Boesenbergia rotunda* is well known to contain a compound called panduratin A, which has been reported to have a potential inhibitory activity against SARS-CoV-2 (COVID-19) and prevent viral replication at both the pre-entry and post-infection phases, and which is more potent than the hydroxychloroquine drug used for COVID-19 treatment [13]. The authors also reported that the availability of important active ingredients may be influenced by genetic variables and agronomic aspects, which are the reasons behind the increase in demand for good phenotype selection in the post-pandemic era. For this reason, Thomya et al. [12] evaluated five local landraces and two wild-types for morphological assessments, genetic evaluation, and bioactive ingredients (mainly antioxidative potentials and the amounts of the active flavonoids). The results of the present study could assist plant breeders in selecting lines with favorable phenotypes, because they revealed that for both domesticated and wild-

types, the morphological characteristics of the plants were not directly correlated with the levels of significant phytochemicals, including panduratin A and pinostrobin, but with various agronomic factors. It was also observed that the adaptation of plants to environmental conditions had a pronounced impact on secondary metabolites' biosynthesis, and such adaptations were likely influenced by genetic differentiation. The authors also highlighted that the potential characteristic of fingerroot might thereafter be employed as a source of medicinal plants for the commercial production of bioactive products for the prevention of SARS-CoV-2 infection.

Another publication in this SI shows the importance of biodiversity by characterizing 14 almond cultivars grown in Mallorca Island in terms of their industrial aptitude and fruit quality. Lipan et al. [14] reveled that these cultivars meet the requirements for being certified under the quality guarantee Protected Geographical Indication "*Almendra de Mallorca*", which is unique in Spain, and how each cultivar presented its own profile, which makes them suitable for different purposes in the food industry.

Finally, one of the publications in this SI was about the utilization of prickly pear peel flour in cake production. El-Beltagi et al. [15] evaluated whether prickly pear peel flour (PPPF) could successfully be used as a natural source of minerals, fiber, and antioxidants in combination with wheat flour to make cakes. The authors revealed that adding PPPF significantly increased the dietary fiber, total polyphenols, flavonoids, antioxidant activity, and minerals in the cakes that were prepared with an addition of 5, 10, and 15% PPPF and decreased the thiobarbituric-acid-reactive substances (TBARSs) in cakes compared to the control. However, it is well known that although nutritional and functional properties are essential for the human body, if the product is not palatable, it can fail in the market. With this in mind, the authors carried out sensory analyses and reported that cakes made with 10% prickly pear flour received the highest score for their smell, taste, or color. This publication demonstrates the importance of such investigations to meet one of the SDGs 2, which promote, among others, sustainable agriculture in which byproducts are reutilized as a good source of nutrients in other food products.

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