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Editorial

Feature Papers in *Horticulturae*

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The presented Feature Papers reflect the diversity of the types of research performed on horticultural plant species, spanning from the basic to the applied, production systems, and postharvest studies, in addition to highlighting some critical issues facing horticultural plant species.

The conservation, propagation, and maintenance of wild progenitor species of valuable horticultural plants, as well as species with potential economic and/or environmental value, are facing significant challenges due to climate change, urban encroachment into undeveloped areas, and invasive species. Marler et al. [1] reviewed the biology, ecology, horticulture, and conservation of the rare, endangered leguminous tree species *Serianthes nelsonii* Merr. As tree mortality is a critical problem, techniques for the successful propagation of the species by seed and via air-layering were discussed as examples of solutions to building seedling populations. However, issues with in situ seedling mortality following transplantation and during long-term growth are continuing concerns which future research must address.

Invasive pest species can have significant negative impacts on plant populations. Marler et al. [2] discussed the critical problem of the armored scale (*Aulacaspis yasumatsui*) to cycads (*Cycas revoluta* Thunb) internationally. They covered the biology, invasion chronology, and host-plant responses of this pest species and efforts in its control. International movement of nursery plants has enabled this pest to negatively impact the international cycad horticulture trade, and growth of the scale population may remain unchecked until efforts establishing non-native biological control can be developed and implemented.

Ornamental species may contribute to improved slope stability along urban and suburban areas. Francini et al. [3] indicated that if ornamental species are to have desirable effects on slope stability, they must have good tolerance to abiotic stresses, such as high and low temperatures, drought, pollution, and nutrient deficiency. The plants that can be used for reducing the erosion of slopes must be in full growth during periods with a higher incidence of rain, and must also be compatible with the temperature ranges of different seasons. Root growth may be considered as a key factor in their usefulness, and could be a useful criterion upon which to select the species best suited for such situations.

The caper (*Capparis spinosa* L.) is currently considered as at risk of genetic erosion, mainly due to overgrazing and overharvesting. This situation may be made more serious because of the lack of efficient propagation techniques, with the caper commonly considered a “difficult-to-propagate species”. Sottile et al. [4] reviewed the main available sexual and vegetative propagation techniques with the aim of assessing whether, and to what extent, this characterization is correct. While seeds show a physiological dormancy that can be lowered by hormonal treatments, vegetative propagation by in vitro techniques appears quite effective. Thus, propagation of the caper is not limiting dissemination of the species, and caper plant material should not be limited for cultivation in high-density, intensive plantings.

Understanding the symbiotic plant–fungus interaction of the orchid *Cattleya purpurata* is valuable for the propagation of this valuable species. Bazzicalupo et al. [5] studied the seed micromorphology, in vitro germination, and early stage seedling morphological traits of the species. Seed morphology was comparable to that of other congeneric species, showing classical adaptations related to aerodynamic properties and to seed wettability.



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Seedling morphology was found to be in line with other taxa from the same genus, showing characteristics typical of epiphytic species.

Production systems for horticultural crops are constantly evolving as new strategies for planting as well as disease and pest management emerge. This is especially true for protected systems. Nicola et al. [6] assessed a closed recirculating system applicable to both open fields and protected cultivation. A lab-scale pilot plant was designed for a standardized and reproducible growing system and was evaluated with production trials of head and multileaf vegetable species and culinary herbs at high plant densities. Both culinary herbs and leafy vegetables performed well in the system. Thus, such a standardized system may be useful for testing numerous other species, substrates, hydroponic nutrient solutions, and fertigation scheduling.

Grilo et al. [7] reported that olive (*Olea europaea*) tree planting density in hedgerows and canopy position affected “Cerasuola” and “Koroneiki” olive oil quality. Fruit in the upper layers of the canopy consistently showed a higher maturity index, higher fat content, higher phenol content and lower water content than lower layers. However, high-density trees showed the largest differences in fruit maturation and water and fat content between upper and lower canopy positions, increasing quality and oil yield variability at harvest. Thus, cultivar, planting density, and canopy architecture may be strong determinants of olive oil yield and composition in hedgerow planting systems.

Zucchini et al. [8] determined whether there is a daily growth hysteresis versus vapor pressure deficit in cherry (*Prunus cerasus*) fruit. Their results indicated that hysteresis can be employed to evaluate the initial phenological phase of fruit maturation, as a fully clockwise hysteresis curve was observable only in the fourth stage of fruit growth. They also discussed how there are opportunities for its use in the management of fruit production, such as for irrigation timing in precision fruit farming.

To improve the understanding of bud development in low- and high-chill Japanese apricot (*Prunus mume*) genotypes, Hsiang et al. [9] characterized floral bud development using a modified BBCH scale and analyzed the relationship between BBCH stages and floral primordium development and the dormancy phase transition in cultivars of each chill type. The floral bud developmental period corresponding to BBCH stages 51–53 includes the transition from endodormancy to ecodormancy. Male meiosis and microspore development occurred during this transition in high-chill cultivars but were detected considerably later than the transition in a low-chill cultivar. A slow or suspended developmental phase was observed only for the high-chill cultivars upon completion of floral primordium organ differentiation, suggesting that chilling may be required to induce floral bud maturation and dormancy release only in high-chill cultivars. Possible relationships among BBCH stages, flowering-related morphological characteristics, and the dormancy phase transition in Japanese apricot are discussed.

New horticultural crops are introduced with regularity to address niche markets. As an example, a growing market for sweet and colorful mini peppers (*Capsicum annum* L.) has been developing, and Giacomini et al. [10] studied postharvest quality and sensory evaluation of the mini sweet peppers. Physical–chemical, nutritional, and sensory analyses of several genotypes indicated that total carotenoids, phenolics, antioxidant activity, vitamin C content, fruit firmness, and sensory analysis of some genotypes were superior to others and may be most desirable to consumers.

Disease and pest management techniques of horticultural crops have been undergoing major changes in recent years, with the push to create more sustainable production systems. While published studies on the methodologies for evaluating stone fruit susceptibility to brown rot are abundant, Mustafa et al. [11] reported that significant variation in the various approaches have limited the ability to compare results from different studies. Thus, they reviewed the literature on phenotyping brown-rot susceptibility in stone fruit, focusing on peach (*Prunus persica*), and discussed ways to manage major factors affecting brown-rot phenotyping studies. Experimental results from multiyear evaluation trials are also described, highlighting year-to-year variability and exploring correlations of

evaluation outcomes among years and assay types, suggesting that choice of phenotyping methodology must be carefully considered in breeding programs.

Marques et al. [12] described advances and challenges in the use of RNA interference (RNAi) technology for citrus Huanglongbing vector control. Despite the availability of specific silencing sequences aimed at a target gene of the insect pest vectors, the uptake of double-stranded RNA is limited in hemipteran insects. Thus, improved delivery methods, stability maintenance, and RNAi response are primary factors contributing to increased effectiveness of exogenous RNAi against hemipteran pests. These approaches can serve as potential tools for efficient disease control.

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