(217) Rootstocks for California Prune (*Prunus domestica*) Production

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Growing prune trees from seed does not produce a tree genetically identical to its parent. Prune seeds are derived from open pollinated flowers so seeds are progeny of parent trees and are not genetically identical. In fruit and nut production, the industry needs every tree producing the same variety. Clonal propagation of fruitwood is one option. However it is much more common to graft the desired variety on a rootstock of choice. This allows a clonal choice for the prune variety and a rootstock choice to manage orchard site problems such as soil type and structure, nematodes and/or diseases. Because prune orchard life may be 25 to 40 years, it is important to anticipate rootstock responses to the soil type where it will be planted and different soil-borne diseases and pests which may be present. Certain rootstocks respond differently than others to soil, disease, and pest problems; selection of the most suitable stock for the proposed site can have a major influence on long-term performance of an orchard. Similarly, with spot or localized replanting, causes of original tree loss should be taken into account in selecting replacement stocks. The plum rootstocks, Myrobalan *(Prunus cerasifera),* Myrobalan 29C (*Prunus cerasifera* cuttings), Mariana 2624 (*Prunus cerasifera* × *Prunus munsoniana*) are most commonly used in California prune orchards. Other *Prunus* species such as peach, almond and apricot are rootstocks used for special situations. The M40 Marianna plum stock is a relatively new release that may in time replace Mariana 2624. Advantages/disadvantages for each rootstock are discussed.

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(218) Pecan Shell Mulch Affects Peach Tree Growth, Yield, and Survival

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Pecan shells are a waste product that are occasionally used for mulch in ornamental landscape settings; yet most shell waste is left in piles near the shelling facility or discarded by other methods. If another use for this waste product could be developed, it may lead to added income for pecan producers. A peach orchard was planted at a spacing of 5.5 m × 6.8 m in Feb. 2005 at the Cimarron Valley Research Station in Perkins, Okla. consisting of several different cultivars on 'Halford' rootstock. From this orchard, the 'Loring' block was chosen to determine what effect pecan mulch would have on peach trees. Five treatments were imposed: no herbicide, no mulch, mow only (Trt 1), herbicide (glyphosate) (Trt 2), 1.8 m × 1.8 m × 5 cm deep mulch (Trt 3), 1.8 m × 1.8 m × 10 cm deep mulch (Trt 4), and 1.8 m × 1.8 m × 15 cm deep mulch (Trt 5). All blooms and fruit were eliminated by frosts or freezes in 2006 and 2007. Yields in 2008 revealed that Trt 1 was statistically the poorest option (13.2 kg/tree and 93 fruit/tree). All other treatments did not differ, but Trt 4 had the highest mean yield (26.4 kg/tree and 195 fruit/tree). Fruit quality (°Brix) and fruit weight did not differ by treatment. Tree growth parameters of tree height, pruning weights, and trunk caliper were not statistically different with the exception of Trt 1 which was significantly less in all three categories beginning in 2007. Tree mortality increased with depth of pecan mulch. Treatments 1–3 had little tree loss (0–5%), whereas Trt 4 and Trt 5 had increased mortality (15% and 35%, respectively). The primary reason for mortality was likely due to record rains in 2007 coupled with the longer moisture retention from deeper mulch.

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(219) Diurnal Variation of Photosynthetic Characteristics in Coolidge Pineapple Guava

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The pineapple guava (*Feijoa sellowiana* Berg.), a great commercial plant for its fruit quality and unique flavor, has been introduced into China in recent years. To better grow this plant for orchard, the diurnal variations of photosynthesis on *Feijoa sellowiana* 'Coolidge' were studied using a Li-6400 portable photosynthesis system. Relationships between net photosynthetic rate (Pn) and its physio-ecological factors, including photosynthetic active radiation (PAR), relative humidity of the air (RH), temperature of leaves (Tl), atmospheric CO_2 concentration (Ca), stomatal conductance (Cond), intercellar CO_2 concentration (Ci), and transpiration rate (Tr) etc. were determined by path analysis and stepwise regression equation. The curve of diurnal variation of Pn was demonstrated two peaks in a clear day, which appeared at 12:00 and 14:00, respectively. There was a clear depression at noon. Correlation analysis showed that there were positive relationship between Pn with Cond and Tr. Their correlation equations were Pn = 6.1883 Cond2+66.0030 Cond-0.6763, (R^2 = 0.893) and Pn = 0.5473 Tr3-5.9285 Tr2+22.1925 Tr-18.042, (R^2 = 0.914), respectively. Among the ecological factors, PAR was the major one that influenced the variations of Pn. Cond and Tr were two key physiological factors that influenced the variations of Pn. The correlation equation between Pn and the major physio-ecological factors was Pn = 73.82-0.0041 PAR+1.8069 RH+1.9585 Tl-0.4479 Ca-102.62 Cond+3.6657 Tr-0.1354 Ci (R^2 = 0.999). This study can provide foundational data on the physiological ecology in pineapple guava for its introduction, cultivation and production.

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(220) Growth and Development of Huafeng Pear

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