

**O-49 (152) Keynote Speaker****REPEATING CYCLES OF ON AND OFF YIELDS IN ALTERNATE BEARING OLIVE, PISTACHIO AND CITRUS ' DIFFERENT MECHANISMS, COMMON SOLUTIONS**

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Alternating high yield on-crop years and low yield off-crop years (alternate bearing) is a common problem of significant economic consequence to the commercial production of woody perennial fruit and nut crops. Not only does alternate bearing complicate orchard management and reduce grower income, it also negatively impacts packinghouse operation, marketing and the stability of commodity-based industries. Alternate bearing is typically initiated by an adverse climate event that results in an off crop, which is followed by an intense bloom that sets an on crop, with little to no flowering the year following the on crop. There are four mechanisms, by which crop load (fruit number/tree) influences return bloom, listed here as the effect of the on crop: (i) reduced summer vegetative shoot growth, fewer, shorter vegetative shoots means there are less nodes to bear inflorescences the following spring; (ii) abscission of floral buds; (iii) repression of key genes required for normal floral development, and (iv) inhibition of spring bud break. All four mechanisms are known to perpetuate alternate bearing in olive (*Olea europaea*), three in citrus (*Citrus reticulata*), with only one demonstrated in pistachio (*Pistacia Vera*) at the present time. For each species, the effects of the on crop are greater for bearing shoots than non-bearing shoots, which by default are the major source of inflorescences the following spring. Thus, on-crop trees need to be managed to create more non-bearing shoots with properly timed fruit thinning, by hand, chemical treatment, or pruning, or potentially by using foliar-applied plant growth regulators to overcome the effects of the on crop and stimulate summer vegetative shoot growth, prevent floral bud abscission, and promote spring bud break to increase return bloom and yield.

**Keywords:** *Citrus reticulata*, *Olea europaea*, *Pistacia vera*, crop load, floral intensity