ALTERNATE BEARING OF THE 'HASS' AVOCADO: THE ROLE OF CARBOHYDRATE *VERSUS* HORMONES

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For the 'Hass' avocado in California, the on crop inhibits bud break of vegetative shoots in summer and fall and floral shoots in spring. Monthly fruit removal from on-crop trees from June through September increased return bloom equal to or greater than off-crop trees and greater than on-crop trees. Later fruit removal had no effect. Floral shoot number in April was related to January bud glucose (r^2 = 0.27) and abscisic acid to isopentyladenosine (ABA:IPA) (r^2 = 0.24) ($P \leq 0.0074$) concentrations. Fruit removal in June reduced August apical bud indoleacetic acid (IAA) and ABA concentrations and increased summer and fall shoot number. In a second experiment, fruit were removed in February and March with no effect on floral intensity in April. Floral shoot number per shoot was related to March bud starch (r^2 = 0.81, P = 0.0001) and ABA:IPA (r^2 = 0.43, P = 0.0234) concentrations. In both experiments, summer-fall shoots contributed more floral shoots per shoot than spring shoots, with floral intensity related to January bud glucose (r^2 = 0.23) and ABA:IPA (r^2 = 0.22) ($P \leq 0.0119$) and March bud starch (r^2 = 0.79) and ABA:IPA (r^2 = 0.38, $P \leq 0.0350$) concentrations, respectively. The stronger relationship of carbohydrate than hormone concentration to return bloom is consistent with the fact that shoots with and without fruit on on-crop trees behave identically during return bloom, suggesting the crop effects the whole tree, in contrast to having an effect localized only to branches bearing fruit.