Recovery from Fire Damage in Avocado Groves

The aftermath of fire in an avocado grove looks devastating, but most of the trees have the potential to recover and be productive again. Unfortunately, it is difficult to determine immediately after the burn the extent of damage to the trees because of the variability of the fire. A slow burn through a grove can be very hot and may kill the living cambium layer (just ¼ inch below the bark) in the trunk. In this case, if the cambium is completely dead, the top of the tree will soon die. Suckers will eventually grow from below the graft union of these trees; these suckers can then be grafted to an appropriate variety. However, many trees in the grove may still be alive internally because there was a quick burn through the grove, or the leaves merely died from heat generated by burning surrounding trees, vegetation and mulch.

The key to recovery is **patience**. Immediately after the fire, it is difficult for us to determine how much of the tree is alive, even by cutting into the cambium with a knife. If the cambium layer below the bark is green and moist, then this tissue is still alive. If the cambium layer is drying, then this tissue is probably dead. Tissue that is charred black deep into the bark and cambium layer is obviously dead. Tissue may be alive on one side of the trunk or branch, and dead on the other side. Therefore, faced with this difficulty, the preferred method of handling trees is to **do nothing** for at least three months. The tree will re-grow shoots from buds that were not injured and begin to form a tree. After it is clear how much wood is alive and dead, then the dead wood should be cut out with a chain saw.

As an alternative method which is rather unique to the avocado industry, **the burned trees can all be stumped immediately and allowed to re-grow.** "Stumping" is a normal practice in the industry when avocado trees have reached such heights that fruit is high off the ground and picking becomes difficult. In many of the groves that were burned, stumping was probably needed anyway; therefore after a burn this would be a reasonable alternative for many growers.

The Decision: Be Patient and Prune… vs. Stumping Immediately:

If the goal of the grower is to bring trees back into production as soon as possible, the avocado tree will usually recover production faster if the grower is patient and prunes only the dead wood three months after the fire.

Unfortunately, this practice creates a permanent problem in the grove as far as irrigation scheduling and application. Mixing full-grown trees (untouched by the fire) with partially pruned trees (and stumped trees) in an irrigation block means that some trees will be over-watered, or under-watered, depending on their size. Adjustments can be made in the sprinkler sizes, but generally this is an undesirable cultural practice.

If the goal is to reduce the size of all trees in the irrigation block to a manageable size, then stumping the block immediately after the fire is the best solution. Trees will be out

of production for three years, and some re-grafting may have to be done, but fertilizing and watering properly is manageable.

A third option could be to scaffold all the trees at 12 feet in height. This would get rid of a lot of dead wood, and may allow trees to come back in production faster than stumping.

Things to Do:

- **Repair and replace melted risers and sprinklers.** It is important to get the irrigation system functioning as soon as possible. A short irrigation (perhaps only for an hour or two) is necessary to moisten the soil to keep the feeder roots alive.
- **Make the decision to stump or delay pruning.** Stumping can be done immediately. If the decision is made to wait, pruning should be delayed until new growth appears. If the trunk (cambium layer) is damaged over 30-40 % of the circumference, the tree should be stumped and the tree may have to be re-grafted.
- **Paint the trunks and large limbs with whitewash or water-based white paint.** Exposed bark can sunburn easily, therefore stumps should be painted immediately after cutting. Un-pruned trees, if exposed significantly to open sun, should also be painted, especially on the south-west side of the tree. Paint doesn't have to be full strength, paint mixed 50/50 with water is sufficient.
- **Reduce irrigation substantially.** Damaged trees cannot use the amount of water they used when healthy. Unneeded irrigations are wasteful, expensive and potentially hazardous to root health. Weed growth should be controlled as weeds use a lot of water. Water should be increased gradually as the trees leaf out and begin to use water. Use soil probes or tensiometers to determine soil moisture.
- **Withhold nitrogen fertilization** until mid-summer or longer. Reduce the amount of nitrogen when application is eventually made. Fertilizer is used to support growth, not to force growth.
- **Apply zinc** as a foliar spray when leaves are two-thirds to three-fourths fully expanded, or through the irrigation system.
- **Apply greenwaste (chipped wood) mulch to the soil.** Since the leaf mulch has burned off (exposing feeder roots to the air), now would be a good time to apply mulch to the soil (at least to a depth of 4 inches). Make sure the mulch has been composted. The heat from composting will kill any spores of Phytophthora root rot fungi and most weed seeds.
- **Contact the County Assessor's Office.** The grove or portions of the grove could be re-assessed for a period of time to reduce the tax liability. In San Diego County, call (858) 505-6262.