EROSION CONTROL AFTER BURNS

BY

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[Mike Skenfield has conducted erosion-control work in the Central Sierra Nevada Range for over 45 years. He has carried out erosion-control on major timber operations, open pit mining areas, reservoirs, highways and bridges. Mike offers the following guidelines for our readers.]

Erosion-control on ground cleared of vegetation must be carried out prior to first rains. Rain drops on bare ground are like tiny bombs that loosen the fine soil particles and put them in solution. On sloping ground the rainwater may begin to run off in sheets or rivulets as the rain volume increases.

Where soils have been burned over by intense surface heat, a number of chemical and physical changes occur to the soil surface. Burned-over soils can become water-repellant. Initial rains can be shed off more readily, carrying ash and debris downslope into drainages. Water repellant characteristics on chaparral-covered soils are more severe than on the pine forest soils and there is little or no effect on grass-covered soil.

Erosion-control efforts can be assigned on a priority basis assuming all vegetative cover has been removed. Since rain water can accumulate on flat areas, then over-flow down the slopes, it is best to begin work at the top of the property being treated. The first priority is to cover the soil against rainfall impact. Straw is the most easily-obtained and distributed cover (Spence Ranch Feed & Supply in Angels Camp is one source). Leaf litter, pine needles and chips can also be used. Soil should be covered with at least 8" of straw mulch in such a manner that the soil cannot be seen through the material.

Since runoff water gains soil-eroding power as it gains velocity downslope, the second priority is runoff management. On sloping ground the runoff can flow as a sheet of water or it can concentrate in a series of rivulets (tiny streams). Both types of flows remove fine soil particles first, then larger particles as the flow velocity increases. Diverting the flow energy by cutting small trenches across the slope (50 ft. - 100 ft. intervals) or by staking down straw wattles diagonally across the slope are types of runoff management.

Most sloping land is bordered either side by ravines (indented topographic features). Flow diversion structures can be directed into the ravines. If the bottom of the ravine is heavily-vegetated, then there is material to slow the flow of runoff water. If it is burned out, then the third priority is to line the ravine bottom and place flow-reduction obstacles at intervals in the channel. The most common ravine lining is a natural product called “jute matting” and can be obtained in rolls of various dimensions.

At intervals of perhaps 100 ft., a structure called a silt fence should be constructed to cross the

ravine. The structure is concave (pointing downslope) and is built as follows:

(1) Dig ditch the shape of the fence bottom going from a visualized high-water line on one side of the ravine to the other. Install 4 to 6 steel "T-bar" fence posts along the downslope side of the ditch.

(2) Place chicken wire along the fence posts and affix as a strong fence (chicken wire in "L" shape with flat bottom of "L" in ditch bottom). Three-foot-wide chicken wire is sufficient. Run 1/8" cable along the top side of the chicken wire, affix to posts and run out the ends at each side to a steel stake set in the slope.

(3) Cover the chicken wire with a "filter fabric" (usually from same source as jute matting) and affix with baling wire to posts. Fill in the bottom ditch to cover fabric and wire and compact it.

The center of the silt fence should provide a slight depression where runoff water can over-flow. The over-flow should spill on to the next segment of jute matting which is lining the ravine bottom.

In my experience, silt fence material with built-in wood lath should not be used in areas (such as a ravine) where runoff water can overpower the stakes. The system described above can only be installed in a ravine (vegetated swale) and not in a feature classified as a stream (see state Fish and Wildlife Code 1600).

In summary, covering bare soil will lessen the effect of rainfall impact. Diverting the runoff flow with ditches or wattles can reduce erosive action. Lining the ravine and installing silt fences can further slow erosive action and will catch much of the eroded soil and debris. After the rainfall season is over, it is important to remove sediment from the silt fences and place it on a flat area covered by mulch. A box garden could benefit from the soil material.

Most of our local soils are low in nitrogen, potassium and phosphorous and could be helped toward revegetation by an application of granular fertilizer. Natural seeding of the ever-present non-native grasses is most likely to occur through the winter. Trying to establish the original "native" grasses is an exercise in futility. The best erosion-control is annual ryegrass (Lolium multiflorum) which eventually gives way to endemic species in the area. Depending on what type of straw is chosen for covering the soil, some seeds of wheat, oats or possibly rice may germinate and last one season.

During the following summer, after the grass seed has dropped (early-to-mid summer), mowing the thatch to ground level, and even clearing the soil for fire-breaks is an essential follow-up for erosion-control.