Seeding After Wildfires in California: Seed with Natives

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Human development in chaparral and other native plant communities increases the risk of destructive wildfires. The recent firestorms that have devastated southern California are a tragic example of this trend. Fire is only one aspect of these tragedies. Accelerated erosion following wildfire can represent an additional threat to life and property. As a result, public agencies are under great pressure to seed burned areas as a solution to erosion prevention. There is a widely held belief that broadcast seeding of exotic annual grasses is necessary to reduce runoff and erosion. There is a growing body of evidence suggests that seeding annual grasses after wildfires may have little effect on erosion and runoff especially in southern California where slope and soil instability is great and winter storms can be destructive (Gautier and Zedler 1982). Indeed, seeding with exotic annual grasses can have a long-term negative impact on native vegetation composition and structure (Conard *et al* 1991). This is not to say that seeding wildfire burn sites should not be done. There are physical and ecological reasons to seed burned and disturbed slopes after fire with appropriate grass and herbaceous plant species. For example, seeding can mitigate the damage to the riparian corridor and fishery habitat. Seeding has a positive impact on wildlife habitat and cover. Concentrating seeding efforts on physically disturbed ground such as bulldozed fire lines and access roads created by fire suppression activities is an important erosion control practice. While seeding may not arrest erosion the first season, there is evidence that second and third year sediment discharge is reduced. It is important to have clear objectives and keep in sight the relationship between short and long-term effects of seeding.

What are some of the pertinent facts related to this controversial issue?

- Seeded annual grasses are slow to become established in the absence of ideal early gentle rains and intense early storms erode reseeded slopes at the same rate as unseeded slopes (Griffin 1982, Gautier and Zedler 1982).
- Most of the sediment discharge from watersheds is derived from existing drainage channel materials and natural dry creep (dry ravel) of materials into these channels (Wakimoto 1979, Scott and Williams 1978, Rice 1973).
- Seeding does not cure poor infiltration rates related to lack of shrub, tree or debris cover and hydrophobic soil layers caused by the heat pulse of hot burns (Gautier and Zedler 1982).
- Heavy annual grass seeding suppresses the recovery of native vegetation including herbaceous fire-following annuals, woody perennials, and tree seedlings (Conard *et al* 1991, Griffin 1982, Gautier 1982, Conrad 1979,Schultz *et al* 1955). Natural annual and perennial plant regrowth provides equal or greater watershed protection than seeded annual grasses (Graves 1979).
- Seeding large areas of montane forest is expensive and is often erratic (Hammond 1977).
- A successful seeded stand of annual grasses, especially Italian ryegrass (*Lolium multiflorum*) results in dry flashy fuels that can carry an injurious fire within the next year following the first seeding (Griffin 1982).
- Annual grass seeding fosters large rodent populations that result in heavy native plant browsing and predation (Griffin 1982).

The use of the most common reseeded annual grass, annual ryegrass (*Lolium multiflorum*), epitomizes all the deleterious effects of reseeding practices. Annual ryegrass is a heavy feeder on the available nutrients released by fire. Luxuriant growth of ryegrass effectively inhibits native plant regeneration. Unmanaged ryegrass stands are approximately 50% dead matter during the following growing season due to mulch cover and the allelopathic effects that suppressed other plant growth. Other heavy-weight exotic grasses often used to control erosion after wildfires are Panoche red brome (*Bromus madritensis* ssp. *rubens*), softchess (*B. hordeaceus*), Zorro or rattail fescue (*Vulpia myuros*), barley (*Hordeum vulgare*), red oats (*Avena sativa*) and Regreen, a sterile *Elymus*/*Triticum* hybrid. The indiscriminate use of these competitive and noxious annual grasses for wildfire seeding should be curtailed.

It is well known by ecologists and land managers in California that seeding fires with annual grasses is merely treating the symptoms of the broader and more important issue of over fifty years of effective fire suppression. Human development into wildland and chaparral communities intensifies suppression efforts and further exasperates the situation. As lawyers and insurance companies get into the act, pointing fingers at neighboring landowners and public agencies for erosion damage, the pressure to "do something" increases. Concentrating revegetation practices on physically disturbed ground such as bulldozed fire lines, on access roads created by fire suppression activities, and buffer areas along burned-out riparian corridors are perhaps the most effective possible erosion control practices. Native perennial grasses such as Cucamonga brome (*Bromus arizonicus*), California brome (*B. carinatus*), blue wildrye (*Elymus glaucus*), meadow barley (*Hordeum brachyantherum*), and six-weeks fescue (*Vulpia microstachys*), gives agencies and land managers a powerful tool to treat the long-range effects of erosion while providing cover and forage for wildlife and inhibiting the invasion of exotic weeds and grasses into our open space lands. Rather than promulgating ecosystem instability these plant materials encourage the natural succession processes of California's native plant communities.

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