

To Seed or Not to Seed

By Jon E. Keeley



Photo courtesy of County of Los Angeles Fire Department

Over a period of less than ten days this past autumn, the Southern California landscape exploded in massive wildfires that burned more than 200,000 acres. Within weeks of this spectacular ecological event, the botanical, ecological and forestry communities throughout the state exploded in a flurry of meetings, press releases and newspaper interviews on the subject of emergency revegetation.

Emergency revegetation is the practice of aerial seeding annual ryegrass (*Lolium multiflorum*) and other exotic annual plants in recently burned watersheds for the purpose of reducing post-fire flooding and sedimentation. Such emergency measures have been widely practiced by county, state and federal agencies throughout California for nearly fifty years. However, during the last decade, this practice has increasingly come under attack on a number of grounds.

The primary reason for not performing emergency revegetation is because these ecosystems have their own "built-in" natural restoration program that is equally effective. Following the apparent devastation of wildfire, chaparral ecosystems still comprise a viable community of living plants. The root systems of many chaparral shrubs survive fire, continue to grow and regenerate the above-ground foliage. In addition, an amazing diversity of species endemic to chaparral have seeds with imposed dormancy mechanisms that require the stimulus of heat, smoke or charred wood for germination. These

species produce a massive growth in the first season after fire.

Proponents for emergency seeding argue that such management is required because the natural regeneration is not completely reliable and does not produce uniform cover on most slopes. While there is some truth in this statement, extensive research over the past couple of decades have accumulated an impressive array of arguments against meddling with the natural process.

There is widespread agreement on the following arguments against emergency reseeding:

- There is little if any chance that emergency reseeding will significantly reduce the loss of life or property from catastrophic flooding or landslides.

- While emergency reseeding may reduce the total erosion from a recent burn site, experience has shown that more often it will have no significant effect. In fact, in one study done several years ago on the Las Pilitas Fire in San Luis Obispo County, there was greatly increased erosion because the presence of ryegrass seed had increased gopher populations, which increased soil disturbance. Such unanticipated effects illustrate the delicate ecological relationships that are potentially upset whenever natural systems are manipulated.

- Numerous studies have shown that when ryegrass establishment is good, it is at the expense of the native vegetation. This has two ramifications. One is that it

disrupts the natural biodiversity of chaparral ecosystems. Many species in these systems restrict their entire life cycle to the post-fire environment. Studies have shown that not only can ryegrass displace these species but also reduce their seed output which threatens their success after future fires. Another critical problem lies in the fact that ryegrass has been shown to out-compete and eliminate seeding reproduction by the native shrubs. This has potential long-term effects because it means less shrub cover in later years, which translates into greater erosion from the site between fires. Indirectly, ryegrass further contributes to this by providing a fine dry fuel in the first summer after fire/which can kindle another fire capable of decimating the shrub seeding population.

For these reasons most organizations concerned about the wise use of public money and natural resources have publicly come out against emergency reseeding. Included among these are the California Native Plant Society and the U.S. National Park Service. The practice, however, persists, and it is clear that a thorough discussion of the topic and alternative measures is needed. To this end a symposium is planned on this subject to be held in May as part of the annual meeting of the Southern California Academy of Sciences. ♦

Jon E. Keeley is a member of the Department of Biology, Occidental College, Los Angeles, Calif.