Certini, G. 2005. Effects of fire on properties of forest soils: a review. Oecologia 143: 1-10.

* Soils become more hydrophobic post-fire and more prone to erosion.
* Severe fires cause significant removal of organic matter, deterioration of both structure and porosity, and considerable loss of nutrients through volatilization, ash entrapment in smoke columns, leaching and erosion, and marked alteration of both quantity and specific composition of microbial and soil-dwelling invertebrate communities.
* fire severity consists of two components
  + intensity: rate at which a fire produces thermal energy
  + duration, results in greatest below ground damage
* heat in moist soil is transported faster and penetrates deeper, latent heat of vaporization prevents soil temperatures from exceeding 95°C until water completely vaporizes; the temperature then typically rises to 200-300°C.
* In presence of heavy fuels, 500-700°C is reached at the soil surface.
* Temperatures at 5cm in the mineral soil rarely exceed 150°C and often no heating occurs below 20-30 cm.
* Organic carbon
  + recovery of soil organic matter is generally fast due to the high net primary productivity of secondary ecological successions
  + Johnson and Curtis (2001) found appositive long-term effect of forest fires on the content of soil org. carbon; sig. avg. C increase in the A horizon associated with fires which occurred more than 10 years before. 3 reasons suggested:
    - incorporation in the mineral soil of unburnt residues that are more protected from biochemical decomp.
    - transformation of fresh org. materials to more recalcitrant forms
    - frequent entrance in the burnt areas of N-fixer species which are able to enhance soil C sequestration.
    - decrease in mineralization rates
* In soils under *Pinus*, Torres and Honrubia (1997) showed that fire causes a particularly marked decrease in basidiomycetes and a selective enrichment of species typically carbonicolous among ascomycetes

Rincon and Pueyo. 2010. Effect of fire severity and site slope on diversity and structure of the ectomycorrhizal fungal community associated with post-fire regenerated *Pinus* *pinaster* Ait. seedlings. Forest Ecology and Management 260: 361-369.

* diversity and structure of EM community associated with post-fire regenerated pine
* influence of fire severity and site slope
* seedlings sampled in first autumn and in both spring and autumn of the second growing season after fire.
* Fire severity nor slope had a significant effect on fungal richness and diversity.
* Conclusions: there was a high potential of active EM inoculum in soil immediately after fire colonizing post-fire natural regenerated pine seedlings with high EM percentages, and that factors defining burn intensity, such as fire severity and topography, directly influenced the species composition and assemblage patters of Em fungal communities.

Román and Miguel. 2005. Post-fire, seasonal and annual dynamics of the ectomycorrhizal community in a *Quercus ilex* L. forest over a 3-year period. Mycorrhiza 15: 471-482.

* low intensity fire in 1994.
* Samples taken over a 3-year period in each study plot in spring, summer, autumn, and winter

Treseder, K.K., M.C. Mack, and A. Cross. 2004. Relationships among fires, fungi, and soil dynamics in Alaskan boreal forests. Ecological applications 14: 1826-1838.

* ECM colonization requires ~15 years to return to pre-burn levels.
* AM not affected
* our analyses indicate that microbial groups responsible for mineralization of organic material (i.e., bacteria and EM fungi) had not recovered within three years following fire.
  + In contrast, Am fungi which take up mineral nutrients only, were briefly affected at most.

Torres and Honrubia. 1997. Changes and effects of a natural fire on ectomycorrhizal inoculum potential of soil in a *Pinus halepensis* forest. Forest ecology and management 96: 189-196.

Fungal Ecology. Chapter 11: Pheonicoid fungi. NJ Dix and J Webster.

* A specialized group (mostly ascomycetes and agarics) fruit amongst the ashes marking the sites of former fires.
  + Phoenicoid
  + pyrophilous
  + anthracophilous
  + carbonicolous
* Chemical, physical, and biological changes in soil after burning
  + increase in pH due to the accumulation of salts which give an alkaline reaction in solution
  + initial increased is followed by differential leaching of salts
  + A consequence of the increased pH of soil after burning is that bacterial populations may increase, including those of nitrogen fixing bacteria.
  + Overall increase in soil temperature due to decrease in canopy cover and understory vegetation
  + burnt soil also have increased exposure to direct rainfall, lower infiltration rates, and increased run-off.
  + reduction in soil porosity due to mortality of soil organisms