



Co-evolution of soils and vegetation in the Aísa Valley Experimental Station (Central Pyrenees)

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Soils and vegetation tend to evolve jointly in relation to climate evolution and the impacts of human activity. This study analyzes soil and vegetation characteristics under various plant covers, using information from the Aísa Valley Experimental Station (AVES), Spanish Pyrenees, from 1991 to 2010. The land uses considered were: dense shrub cover, grazing meadow, abandoned field, cereal (barley), abandoned shifting agriculture, active shifting agriculture, burnt1 and burnt2 plots, and in-fallow plot. All the plots were installed on a field abandoned 45 years ago. Some of the plots did not change in plant cover through the study period (e.g., the meadow, cereal and shifting agriculture plots), but others underwent changes in density and composition, such as:

- (i) The dense shrub cover plot represents the natural evolution of the abandoned field. When the AVES was equipped, this plot was completely dominated by *Genista scorpius*, with a few stands of *Rosa gr. Canina*. Twenty years later, *Genista scorpius* is affected of senescence and shows almost no regeneration capacity.
- (ii) The abandoned field had previously been cultivated with cereals until 1993. Once abandoned, the progression of plant colonization was very rapid. Firstly with grasses and, 10 years later, with *Genista scorpius*. At present, this latter occupies more than 50% of the plot.
- (iii) The evolution of plant colonization in the abandoned shifting agriculture plot was slower than that in the 'normal' abandoned field, mainly because of the differences in fertilization when they were cultivated.
- (iv) One of the burnt plots evolved from 0% to a coverage of almost 100% in a short period, whereas the other plot remained with a shrub density of about 60% several years after the fire.

Soil samples (superficial and depth) were analyzed to obtain physical and chemical properties: structure, texture, pH, CaCO₃, Organic Matter and various anions and cations. The main purpose was to detect differences in the soil properties as a consequence of land cover/land uses.