



The biologic correction of gullies by *Atriplex halimus* plantation

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With the objective of rehabilitation of gullied slopes on the north banks of the Oued Grou, the option was to plant *Atriplex halimus*, a fodder shrub adapted to semi-arid environments, on degraded lands with about 30% slope, with a mineral soil developed on 1-2 m of colluvial formations, on top of Messinian sandy marls.

This paper presents an evaluation of this SWC technique, to assess its effect in term of soil protection and vegetation restoration. The monitoring concerned several parameters:

- the covering of the herbaceous vegetation, its biomass and the floristic biodiversity,
- evaluation of the fodder production : mineral part, organic part, fat, nitrogen matter, cellulose, and digestibility in vitro of the organic matter;
- soil state surface: soil moisture, resistance to penetration, cohesion, rate of pebbles on the surface and of the encrusted parts.
- Observations on the gullies transversal profile and on the steepness of the banks.

The results of the monitoring during one year show that the *Atriplex* technique for correction of the gullies present several advantages:

- Increase of the covering rate by herbaceous plants and of the degree of the soil protection; the rate of surface covered by herbaceous increases from 57% in the eroded fields to 87% in the planted plot, during spring.
- Improvement of the quality of the herbaceous vegetation, with an increase of the permanent species, 3 times, after one year.
- Improvement of the floristic biodiversity: in the *Atriplex* plot, the number of species is 2 times the one in the non protected slopes.
- Increase of the vegetation biomass: the total palatable biomass has increased from 360 kg/ha to 1235, after management.
- Improvement of the quality of fodder: the rate of nitrogen matter increased from 34 to 190 kg/ha and the rate of cellulose from 63 to 211 kg/ha.
- Increase of the fodder production, from 127 fodder units per ha to 694, which represents a rate of 72%.
- Improvement of the soil surface. In the *atriplex* plot is recorded a higher soil moisture than in the non protected slopes, and a weaker resistance to penetration as well as a lower cohesion.
- The observations made during the intense episodes of rain of the winter 2010 show that in the *atriplex* plot more rain is infiltrated and less runoff is recorded. This process appears through the profiles of the gullies which already show less steepness and more sharp banks.

The soil management by *atriplex* plantation offers a good opportunity for both fodder production and soil conservation. The main factor responsible of this trend is the plot fencing during the phase of *atriplex* growing and herbaceous recovering. Less animal pressure on the vegetation cover and on the soil is then the solution for gullies cicatrisation and for ecosystem stability.