

## Cultivating the surface soil to renovate a Grama Rhodes (*Chloris gayana* K .cv .Callide) pasture in northwest Argentine (NOA) .1 Effect of implements

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**Introduction** Tropical pastures grow prolifically after cleared native vegetation but subsequently decline .The deterioration of grass pastures are associated with reduced availability of nitrogen in the soil under permanent stands of grass .Cultivation can stimulate the production of nitrogen compounds available to plant roots .

**Material and methods** At Cerrillos Salta (24°54'S ; 65°29'W ; 1250 m .) ,Argentina ,on a grama Rhodes pasture seeded in 1994 a trial was carried out in November 2000 ,when the site was closed .Soil at the site was a Ustocrept udico with (0-20 cm) 6 .4 % , 24 % ,0 .13% and 5 ppm of pH ,Organic Matter . ,N ,and P extractable respectively .Total rainfall and means temperature for 2000/01 ; 01/02 ; 02/03 ; 03/04 and 04/05 ,covering the experimental period (May-November) were 844 .7 ; 566 .3 ; 548 .2 ; 562 .4 and 356 .0 mm and 19 .5 ; 19 .3 ; 19 .5 ; 17 .7 and 19 .3°C .The historical annual averages for the site were 643 mm and 19°C .Five implements were employed ; (1) Control ,no cultivation ,(2) Paraplow (Paratilt) ,rigidly mounted and set 100 cm . apart ,(3) Offset disc harrows ; (4) and (5) Chisel (5 cm wide) ,rigidly mounted at 25 and 50 cm apart respectively .Plots of 195 m<sup>2</sup> arrangement on split-split plot design ,with three replications were used .Plots with 50 cm of average canopy height were hand clipped .Pasture yield was obtained at each harvest using a hoop with 0 .25 m<sup>2</sup> area at stratified random positions in the plots .Seven harvest of plant material were taken between Nov .2000 and March 2005 .Grass in the hoot was cut to at 5 cm . stubble and the harvested material bulked to give one sample for each plot .Nitrogen and dry matter content were determined (A .O .A .C . ,1980) .At end of sampling plots were grazing with steers and cut with a machine .

**Results and discussion** The implements of cultivation did not affected the total yield of forage (Table 1) or nitrogen content , probably due to a low rate of nitrogen mineralization ,that occur in soils with low N content and intensively used ,such as in this trial .During the periods 2003/04 ,and mainly in 04/05 ,after cultivation ,lack of rains occur ,resulting in increased of weeds encroachment with severity of the cultivation .

**Table 1** Effect of cultivation treatments on the total dry matter (D.M.) yields and N of Grama Rhodes and weeds .

Implements	Grama DM kg ha <sup>-1</sup>	Grama N kg ha <sup>-1</sup>	Weeds D .M . kg ha <sup>-1</sup>
Control	17276a	202a	292b ,c
Paraplow	18006a	201a	17c
Disc Harrow	16638a	192a	1001a
Chisel at 25cm	17512a	191a	406b ,c
Chisel at 50cm	17771a	180a	691a ,b
MSE <sup>z</sup>	2633 .5	36 .2	548

a ,b ,c : Values on the same column with different letters are different ,P<0 .05 Duncan Test .

z : Standard error of the mean .

**Conclusions** There was no production response from grama Rhodes after cultivation in soil with low fertility like one employed in this experiment .The use of low disturbance methods of cultivation must be employed to avoid weeds encroachment .

### Reference

A .O .A .C . ,1980 .Ass .Off .Agr .Chemistry .Official Methods of Analysis .Washington ,D .C . .