

DETERMINATION OF LOSSES AND CRITICAL PERIOD
OF COMPETITION FOR WEEDS IN CORN AT THE PROVINCES OF LEON AND
CHINANDEGA, NICARAGUA. I

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Introduction

The provinces of Leon and Chinandega located in the pacific zone of Nicaragua **are** mainly agricultural aereas. The chief crop since 1980 has been corn,which produce an average of 1 ton per acre. However, this average has been going down in the last 3 years because of the scarcity.of chemical compounds to control weeds. These weeds growing in vigorous competition with crop corn constituting a serious problem for the corn production in this area.

The high weed populations in Nicaragua as most of the tropical countries is because of climatic and cultural conditions that favor active plant growth and often the production of more than one generation of weeds annually. These weeds are able to compete with the crop for space,which is composite, for all resources necessary for growth, as well as their interaction. Weeds also compete with the crop by faster and higher growth,larpe leaves and climbing devices. Therefore species with one or all

these strategies can be considered as strong competitors for ligh to the crop . Naturally competi ion for light begins at the momens **when plants** begin to shade each other. Morover, **as the different** crops different weed species show great **differences in their susceptibility** to shading. Especially in the early phases when there is still no lightt interception for nutrients, **especially** nitrogen, which can not be supplemented as fast as it is taker, up by fast growing **weeds**. **In adition many** weed species show **about the same develop as the** crop and **therefore** about **the same** course of nutrients

requirements. Finally, **weeds** compete **for** water **the** prolific growth of weeds, especially perennial ones such as the tropical weed *Cyperus rotundus*, **severely limit the** availability of water to the crops. There are also weeds with a root system well-developed that permit them to get water more efficiently than the crop. On the other hand, the amount of weed competition **to a** crop depends on the crop, the weed species forming the weed community and their densities, the climate, the soil, and so on.

For all the foregoing is practically impossible to keep the crop free of weeds, but we do not for **this** particular locality which is the yield loss caused by weeds, we also do not when, during the crop growth the competition, is stronger. Therefore, to try to help **the** corn producer in **this** problem, I have decided to make **a field**

experiment to know what is the yield loss when weeds are not removed and I also want to know when is the critical period of weed competition, because in that way I will be able to suggest when is more important to remove the weeds using the little chemical compounds that they have.

Method

This experiment has to be done between May 15 and August 15 on areas with average ecological factors in the corn field of Leon and Chinandega. The study area will be of 6 ha. The habitat is agricultural land with an annual rainfall of 1600 mm of which falls between May to October. I will do plots of 4 corn rows by 10 m long. Considering that corn crop in this area is ready to harvest in 90 days. I will do 10 plots, plot 1 with weed control, plot 2 without weed control, plot 3 without weed control the first 10 days, plot 4 without weed control the first 20 days and so on. I will also repeat the same experiment on 2 more different places in the total area.

The weeds will be removed with their roots from the corn crop manually in the early part of the growing season, after weeds are large using hoes or sharp knives to sever weeds at the soil surface. When weeds are very small I will use an application of contact-type herbicide. The harvest will be manual to prevent

injuries that may be caused by the **mechanical** equipment.

Interpretation of data

Interpretation of data *will be* on basis of **the** harvest, comparing the plot with weed control and the plot without weed **control**, I can determine the total losses caused **by** the weeds, and by means of an analysis of variance between plot 1 and the *other* treatment, I can determine which one of them **have** more degree of freedom and therefore to know **when** the critical period of **weeds competition** is for this crop in this particular area.

Expected results.

The expected results are that on plot **1** the crop grow **will be** very well and will have the higher yield, plot 2 of course will have the lower yield because it will be all the time growing in competition with **weeds**, **plots 3 and 4** probably will not **have a big difference** with **plot 1**, **this because** at **the beginning** the root-system in **both** crop and weeds is **not well-developed**, therefore competition for water or nutrients **is not** so high **and** also because **they** still do not shade each other, **plots 5,6,7**, will probably have a decline on **the yield** because in **this** period the weeds as **the** crop are in the growing, flowering, **and** fructing stages, therefore **they** need to use a **lot** of **the**

resources, so the competition occurs, plots 8, 9, 10, will not have significant difference with plot 1 because in this period the plants are in the ripeness process and they do not need to compete for the resources.

Discussion of the significance of this work.

This work will be important because it will be a practical **way** to show to the farmers, administrators, **etc**, how much the weeds can decrease the yield of corn, it will also be in practice useful to know when the best time to apply the chemical compounds, mainly when the farmers or whoever does not have enough of them.

This experiment will measure competition between crop and weed population in gross way but it will not show the competitive

relationship between crop and each species of weeds, however sometimes is important to know the competition for species because perhaps the farmers apply chemical compounds to kill weeds that are not too nocives for the crop.

Finally, I want **to** say that even when this experiment will not show everything, it will show when weed control must be implemented to achieve maximum returns from the corn crop in that particular area.