
The Value of Weeds in a Corn Field

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Reference: L. Vieyra-Odilon and H. Vibrans. 2001. Weeds as Crops: the value of maize field weeds in the valley of Toluca, Mexico. *Economic Botany* 55(3): 426-443.

When I was a child growing up in Ohio, my parents relied heavily on the summer garden to feed our family through the year. I noticed that they kept it well weeded until a certain time, then let the weeds grow. We had all the tomatoes, peppers, potatoes and cucumbers we could eat, even if we had to look through some weeds to find them. Farmers in the Toluca valley in Mexico do the same thing in their cornfields, but not merely to save labor. The weeds themselves are a surprisingly valuable commodity. The authors of this article did an exceptionally extensive study of the practice and economics of growing corn—and of selling or using the weeds.

During one rainy season, they regularly interviewed 24 families in the village and 10 vendors at a regional market about type and quantity of weed use. Also the weed vegetation was surveyed and 49 farmers were interviewed concerning their farming practices and costs. All of the 74 weed species found in cornfields were useful, whether as a forage, a potherb (an edible annual plant), or a medicinal or ornamental plant.

Within the village, 11 species were eaten. The average family consumed 4.5 kg of wild potherbs per month during the rainy season. In the market at Ixtlahuaca, 2,150 kg of 10 species were sold as potherbs, worth US\$611. For quantity and gross economic value, plants used as forages were much more important. On the average 1 hectare of corn produced a harvest of 1.5 tons of green forage, worth about 25% of the gross value of the corn harvest and 55% of its net value. The combination of corn interspersed with forage weeds that can be fed to stabled animals constitutes an interesting integrated farming system. The weeds increase the useful biomass of the field, improve nutrition of the farmers, do not reduce the yield of the main crop (because the fields are kept weed-free during the critical period) and provide erosion control, shade and green manure. The use of weeds in cornfields is facilitated by the fact that one can walk around in a cornfield without damaging the crop, which is not possible in, for example, a wheat or oat field.

Some species of gathered potherbs (mainly *Chenopodium berlandieri* and *Amaranthus hybridus*) arrive daily at the large wholesale market of Mexico City by the truckload, and are widely available in city supermarkets as well as in the traditional weekly markets in Central Mexico. Other

species are marketed on a more local scale. Edible herbs enter trade primarily in the highland and humid tropics, less so in arid regions. Feeding cornfield weeds to domestic animals is a common practice in the whole central highlands of Mexico.

The study area was located in the south-center of Mexico, at about latitude 19° N. There was a summer rainy season, then a dry season. Frosts were frequent at night from November-February.

Corn was sown sometime between early March and mid-May (depending on the variety). Corn was spaced at 3-6 cm planting distance within the row and 80 cm between rows. Farmers cultivate with a cultivator for the first time at the three-leaf stage near the beginning of the rainy season; the second cultivation, with a plow, follows 20-25 days later when the plants are 35-50 cm tall; sometimes there is a third cultivation.

The cornfields are virtually weed free until about June. By that time, the corn forms a dense cover, the critical phase of competition is over and the weeds that subsequently germinate are traditionally left to grow freely. It has been shown repeatedly—and it is common knowledge among farmers—that application of herbicides at this stage does not improve the yield. Even so, today herbicides are sprayed in many areas to make harvesting easier (reduction in spines, stickers etc.). However, even where herbicides are used, owners of animals will leave an adequate surface untreated to use the weeds later as forage or potherbs. Often weeds are left to grow near the field margins, as they are easier to transport from there.

A look at the economics of growing corn in the study area shows that weeds can be very valuable. The total cost for growing one hectare of corn is US\$367 using a tractor and US\$319 using animal traction. The sales price of the harvested corn was US\$600-800, based on a yield of 3-4 t/ha and a price of US\$200 per ton (for an average income per ha of \$700). The authors found that the average yield of forage per household was 2661 kg, valued at US\$346 (US\$111 per hectare). So on the average, the weeds were worth 33% of the gross value of the corn harvest ($\$111 \div (\$700 - \$367) = 33\%$).

For some farmers, the weed harvest was worth far more than half of the maize harvest. In regions with a less productive agriculture, or in years with lower maize prices, these percentages easily could be even higher.

If harvesting weeds is so profitable, why do many farmers now use only part of the wild plants that grow in their fields, and spray herbicides on the rest? The authors speculate that (1) there is an upper limit to how many animals can be looked after in periods of high labor demand; (2) costs for feed during the dry season may be too high for most farmers to afford [Editor (MLP): numbers of animals on a farm are limited by the amount of feed at the END of the dry season, so an abundance of feed at one season is not a predictor of how many animals the farmer can keep.]; (3) techniques for conserving fodder are not known (hay-making, silaging); (4) harvesting weeds is hard physical labor; and (5) cheap external labor is not available on a consistent basis.