

# **RECOVERY OF ANCIENT CULTIVATION LANDS BELONGING TO THE ABORIGINAL COMMUNITIES IN HUMAHUACA - JUJUY, ARGENTINA.**

**Juarez J.A., Sanchez Mera S.**

Fundación para el Cambio, Alvear 573, 4600, San Salvador de Jujuy. Jujuy, Argentina, Phone: 054-0388-4236601, Email: [delta@arnet.com.ar](mailto:delta@arnet.com.ar)

Embajada de Australia, Villanueva 1400 - 1426 Phone: 4779-3500 / Fax: 4772-3349. Buenos Aires, Argentina, Email: [info.ba.general@dfat.gov.au](mailto:info.ba.general@dfat.gov.au)

## **1 INTRODUCTION**

The residents of El Morado are mostly agro-livestock smallholders of native coya descent.. Almost all their products are for family use, offering only small amounts for sale. Hundreds of years of exploitation has significantly affected the fertility of their fields. The great variability in physical and chemical composition of the soils (Duchaufour, 1975) makes crop production difficult. Earthworms provide a powerful tool for the recovery of the agricultural potential of these soils through the use of their organic waste transformed into vermicompost

### **1.1 Antecedents**

These farmers showed an effective creativity to solve or overcome the limitations that arise with the use of this new technique in the production system through the ingenious use of available resources in each of the different locations.

### **1.2 Objectives**

- Recovery of agricultural land by means of fertilization using organic and natural products.
- Improving the economic viability of the community of very high poverty level.

## **2 MATERIALS AND METHODS**

El Morado is located 8 km from the town of Humahuaca, at the side of National Road N° 9 in Jujuy, Argentina. Temperatures range from 28°C in summer to below freezing in winter. Although rainfall is scarce, villagers traditionally practise agriculture as the only economic support of the family. The aboriginal people show a rich heritage in farming, but due to the "progress of civilization" they have lost their traditional customs such as taking care of their land with natural fertilizers

The beneficiaries of the project have been actively involved from the very beginning, since the same members of the organized aboriginal community from El Morado, through their representatives, have requested our collaboration and advice to this project.

Each farming family offered their own land for the construction of a humus production bed. In total, 11 vermiculture units were installed, one in each field. We used 50 cubic meters of goat manure, bought and transported by truck and distributed among the 11 families who participated in the project.

In each case, the humus production beds were made by digging a hole of variable size (depending on space availability). We used this technique to prevent moisture loss in the beds because the region is of dry climate. Each producer received personalized instruction on the basics of vermiculture. After instruction, each one produced his own model, using the manure that was delivered. Once conditioned and stabilized through composting, samples were extracted for laboratory analysis. When manure beds were ready, breeding nuclei of red worms were sown. Each core contained 2000 red worms.

Once the beds were ready and the worms planted, regular monitoring was conducted to ensure proper control and management of the techniques taught. The transformation process from animal manure into humus took approximately 4 months. The humus of the first bed was harvested and bagged immediately to maintain its natural potential. Producers learned the technique of "food management" to extract the red worms from the compost, which

were then used in a new bed of manure placed parallel to the first. Thus, the worms were attracted by the food and moved to the new bed.

The humus was used in the nursery or mixed with soil and leaf litter. They prepared a mixture of consisting 70% earth and 30% worm-humus.

Humus is also used for field application, using the technique of localized fertilization, using worm compost (40 to 90 Grams) to each plant during transplantation or together with the seed during plantation. Samples were sent for laboratory analysis.

Materials required included Goat manure (50 m<sup>3</sup>), mesh plastic (55 m<sup>2</sup> coverage), pushcart, shovel and irrigator.

### 3 RESULTS AND DISCUSSION

The bio fertilization techniques enable a first quality product to be obtained. At the same time it induces in those who practice it, the idea of preserving the nutrient cycle, so important to original inhabitants of the Quebrada de Humahuaca and their arid fields. The technique of red worm breeding was quickly interpreted by farmers who developed their own particular form of production beds, using each one his own resources. This allowed the exchange of experience between themselves and facilitated the incorporation of the technique in most cases. The use of compost significantly improved the development of seedlings and crops where properly used.

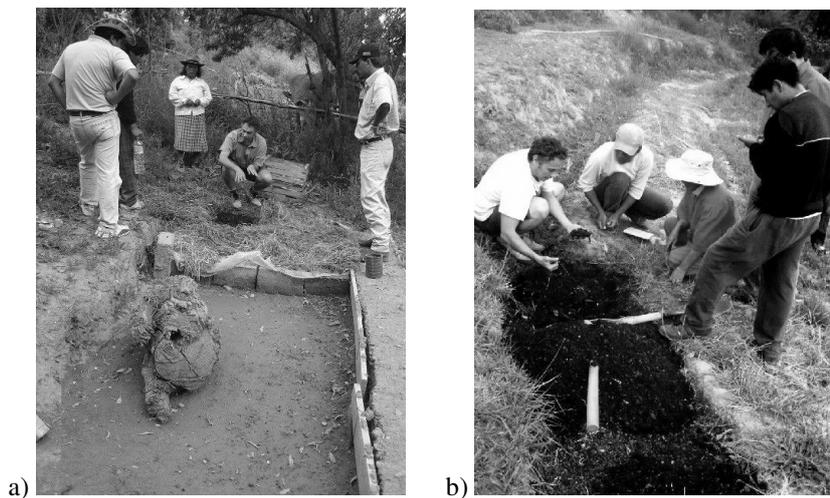


FIGURE1 a) Preparing the bed , b) Placing manure

TABLE 1 Methodology

ACTIVITIES	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7
1. Preparing the physical place							
2. Manure aquisition							
3. Building the beds							
4. Seeding worms							
5. Monitoring process							
6. Technical supervision							
7. Laboratory analysis							



FIGURE2 a) Vermicompost extraction b) Seedbeds with vermicompost

#### 4 CONCLUSIONS

The use of organic waste in agriculture is a global trend, as fertilizers, for nutrient extraction and recycling and to reduce environmental pollution (Barroilhet, 2003). Regional agriculture and vegetable production increasingly require inputs that are not only safe and harmless to the environment, but also contribute to the preservation of soil fertility and beneficial microorganisms. These improved chemical and biological properties of soil, causing the soil to retain more water reduces reliance on chemical fertilizers (Laos and Mazarino, 1996). Vermicompost is one of the most efficient products used until now, not only as an organic fertilizer but also as a conditioner for depleted soils. The red worm can be considered as one of the best educational tools for these projects.

#### ACKNOWLEDGEMENTS

Our great appreciation to the Australian Embassy's authorities, whose excellent support and disposition made possible our Intervension the Aboriginal Community of El Morado

#### REFERENCES

- Duchaufour 1975. Manual de Edafología I y II. 1º Ed Toray-Mason S.A. Barcelona, España. 471 p.
- Laos F, Mazarino M 1996. Liberación de nutrientes de residuos orgánicos derivados de la actividad piscícola y urbana en la región Andino-Patagónica Argentina. Ciencias del suelo (14:24-29)
- Martin Barroilhet AM 2003. Efecto de la aplicación de biosólidos compostados sobre la producción de zapallo italiano para semilla. *Cucúrbita pepo* L. Corporación Universidad de Aconcagua. Viña del Mar-Chile.