

Promoting Vetiver Grass Technology in Venezuela

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Abstract

A two year project (1997-99) was conducted by the Sociedad Conservacionista Aragua (Sca) with financial and technical support of The Vetiver Network (TVN), and sponsored by other local institutions like the Aragua's State Secretary of the Environment and the Central University of Venezuela. Twelve workshops were organized and more than three hundred participants received training on vetiver grass technology (VGT). The trainees were extension workers, technicians, university students, farmers and representatives of NGO's. A good geographical distribution of project activities was achieved as is shown in a map developed by the project. High priority was given to the production of written material, including a technical bulletin, newspaper and journal articles, and a series of brochures to support the project activities. Other priority was the participation in different meetings where specialized and general public become aware of vetiver applications for erosion control and environmental protection. Field demonstration plots were developed in three locations with different agro-ecological and farming conditions. VGT performance was proved to have a high potential for adoption among farmers for soil conservation, and for enhancing development of sustainable land use systems.

Introduction

Soil erosion induced by water on sloping areas is of major concern in Venezuela due to its negative impacts on land productivity, ecosystem balance and infrastructure stability and performance. The last is true particularly on water reservoirs, where storage capacity and water quality are diminished by sediment and pollutants accumulation.

In 1997, Sociedad Conservacionista Aragua (SCA), a non governmental organization with a long record on environmental education, based on previous experiences with vetiver grass hedgerows as an effective and proved water erosion control technology, decided to promote the use of vetiver in Venezuela. SCA is located in Maracay, Aragua State in the North Central Region of Venezuela. In order to help the country to achieve better standards of natural resource use by using simple and proved erosion control systems in different private and public programs, a project leaded by SCA to promote Vetiver Grass Technology (VGT) in Venezuela was launched. A two years project was developed during the period June 1997-July 1999, with the financial and technical support of The Vetiver Network(TVN), and sponsored by other local institutions like the Aragua's State Secretary of the Environment and the School of Agronomy at the Central University of Venezuela.

The purpose of this paper is to describe the main activities conducted through the implementation of the project to promote VGT in Venezuela and to account the project's main achievements. The main source of information were the reports submitted to TVN during and after the project was concluded (SCA 1999). The main project activities were:

- ◆ Workshops organization
 - ◆ Printed material production
 - ◆ Nursery development, propagation material distribution and field demonstrations
 - ◆ Training, research and development support
 - ◆ Expositions, seminars and professional meetings participation
- A detailed description of these activities follows.

Workshops

Twelve different workshops were conducted in different locations of Venezuela and can be considered one of the most important activities performed during the project period. Since VGT was unknown by most technicians and researchers as well as potential users, it was thought that an starting an important strategy would be to organize workshops to present and discuss the advantages of using vetiver for erosion control and environmental protection, and to give the basic training on this technology. The workshops were designed to last four hours and included: an introduction on land degradation and soil and water conservation, description of vetiver general characteristics and particular features that encourage its use for erosion control and environmental protection, main propagation and establishment techniques, hedgerow field layout design, maintenance, bioengineering and alternative applications and uses. The use of slides, videos and a transparencies kit specially developed for the workshops were valuable aids to reach the audience. Vetiver plants and documents were distributed among participants to ensure their ability to start, or continue their own projects or applications of VGT. The audience of the workshops was mainly composed of technicians and professionals working in agriculture and environment issues.

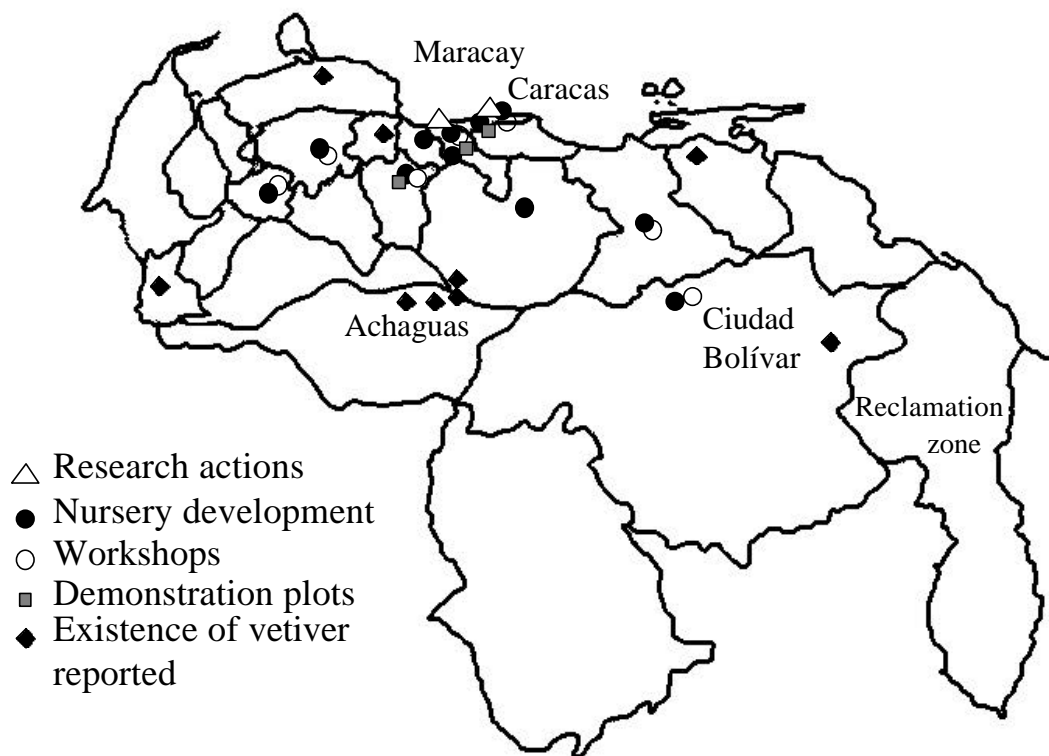


Fig. 1. Vetiver activities in Venezuela

Table 1. Workshops on vetiver organized by Sociedad Conservacionista Aragua during the project period (1997-99)

Workshop #	Date	Place	Co-organizer	Number of participants	Audience
1	07/10/97	Maracay, Aragua State	FUNDACITE Aragua	34	Technicians and professionals
2	11/13/97	Maracay, Aragua State	School of Agronomy, UCV-NRAC Lab.	74	Students, professionals and ONGs' members
3	12/10/97	Caracas, Dto. Federal	Simon Bolivar University	09	Technicians and professionals
4	01/23/98	Trujillo, Trujillo State	CIARA	19	Technicians and professionals
5	01/30/98	Trujillo, Trujillo State	CIARA	16	Technicians and professionals
6	06/27/98	Maracay, Aragua State	Environment Issues Office, Aragua State	10	Students, professionals and ONGs' members
7	09/25/98	Barquisimeto, Lara State	School of Agronomy, UCLA	34	Students and professionals
8	02/25/99	San Tome, Anzoategui State	PALMAVEN	28	Engineers and technicians
9	02/26/99	Ciudad Bolivar, Bolivar State	IAMOT and FUNDAGEOMINAS	38	Geology students, NGOs' members.
10	06/17/99	Macapo, Cojedes State	CORIAGRO	30	Extension technicians and local farmers
11	07/02/99	Maracay, Aragua State	School of Agronomy, UCV-Student Union.	35	Engineers and technicians, students
12	07/09/99	Petaquire, Vargas State	Bajo Seco Exp. Station, UCV-FAGRO	14	Extension technicians, farmers, laborers
TOTAL				341	

Extension agents, farmers, students, entrepreneurs and general public were welcomed to participate. A total of 341 participants attended the workshops and acquire basic knowledge to apply and use vetiver for different purposes in a very intensive and participatory way. A summary of the workshops characteristics is presented in Table 1. Also, the spatial distribution of locations where workshops were held within the country is shown in Fig.1.

Printed Material Production

The compilation and reproduction of the No.19 SCA Technical Bulletin: "*Vetiver: Una Planta Para el Control de la Erosion y la Proteccion Ambiental*" (Vetiver: A Plant for Erosion

Control and Environmental Protection) (Rodriguez 1997), was an opportune and useful action as this written material not only supports project activities, especially as a documentation for workshop attendants, but also as a source of information to introduce VGT to new users. It consists of 36 pages, including figures and tables, describing the origin and characteristics of vetiver, basic concepts and the VGT design and application, some examples of experimental data illustrating the effectiveness of vetiver hedgerows in soil conservation, and a summary of other alternative uses. In addition, a set of five brochures with specific content on VGT: general, propagation, establishment, bioengineering and alternative applications were distributed among workshop participants, soil conservation students and general public. The main advantage of these publications is that they reached an audience of a wide spectrum in terms of both: number of persons knowing about vetiver, and in relation to their location. Taking into account the same idea, short newspaper and magazine articles were delivered through local papers like *El Aragü eño* and *El Siglo*, in which Sociedad Conservacionista Aragua keeps a weekly environmental informative and educational section granted by the editors. Other publications provided by The Vetiver Network and The Latin American Vetiver Network, like the Spanish version of the “green book”, the “blue book” (from the US National Academy of Science), and technical bulletins, among others, were distributed to libraries and key institutions leaders in the agricultural and environmental sector. Some publications were given as a prize to outstanding students of the School of Agronomy, and others were raffled among workshop participants due to shortage of material for all of them, something that helped raise the interest and attention of attendants at the end of the workshops.

Nursery Development, Propagation Material Distribution and Field Demonstrations

Nursery development was another fundamental activity of the project. SCA started a 200-plant propagation field before the initiation of the project activities, so there was some material available at the beginning of the project. Also, an small expedition was made in June 1997 to Achaguas, a town located in Apure State in Venezuela, 500 km from Maracay where SCA office is located. The trip revealed that vetiver was introduced to the country long time ago and that was used for traditional medicine and as a thatching material in this location. Enough propagation material was found available to start the project. Propagation material was transported to Maracay to establish a larger scale nursery. Later, at the end of 1997, and during 1998 and 1999, other institutions and individuals induced by the project, started their own nurseries as shown in the map in Fig.1. Vetiver plants produced in polybags and slips were distributed for free in small amounts to workshop participants and interested institutions and individuals. Whenever possible, a contribution or payment from the recipient was charged, especially from commercial users or institutions that can afford the costs and demand a large amount of vetiver plants.

Three main demonstration sites were developed during the project implementation period with the help of agronomy students. They were located in different agro-ecological environments, one in Macapo, Cojedes State, representing a tropical seasonal weather, and one in Petaquire, Vargas State, representing a cold highland environment. Another demonstration site was developed in The Central University of Venezuela-Maracay as a drainage channel stabilization measure. Main characteristics of this sites are summarized in Table 2 and its geographical location is showed in Fig. 1. A remarkable experience was to observe that the vetiver barrier established in Macapo in 1997, re-grew vigorously after being burned. Vetiver emerged before weeds, demonstrating a very good adaptation to the site's conditions.

Table 2. Demonstration sites characteristics

Locality	Life zone / landscape	Average rain fall (mm)	Farming conditions	Vetiver adaptation / other comments
Macapo	Dry tropical forest / hills	1500	Mixed maize- cassava Traditional system on steep slopes	Excellent / fire and drought resistance
Maracay	Premontane dry forest / valley	922	Drainage channel Experimental field flat	Excellent / drought resistance
Petaquire	Transition lower montane dry to humid forest / mountain	860	High intensity, cash horticultural system on steep slopes	Good / slower growth speed

Training, Research and Development Support

At SCA library in Maracay, books, bulletins and other published materials (CDs, videos, etc) related to vetiver grass technology are available, in Spanish and English. The technical bulletin, brochures and handouts are available for those interested in develop their own activities with vetiver. At SCA office there is also a permanent exposition on vetiver that is frequently visited by scholars and NGOs groups. It shows the multiple applications of vetiver for environmental protection, and a large vetiver plant with its roots is exposed, demonstrating the special anatomy of the dense and deep vetiver roots, as well as the strong clump and stiff stems and leaves. These characteristics make vetiver a particular good plant to build vegetative barriers and must be exhibited to the public. Technical assistance is given in a continuous basis through personal contact, telephone, fax or e-mail. It is interesting to point out that, besides the importance of vetiver for the rural agricultural areas, the bioengineering activities are turning into attractive applications for small and medium size enterprises working on soil conservation and related environmental activities. Many of the information requests received were related to non-agricultural applications.

Five theses developed in the School of Agronomy of the Central University of Venezuela were benefited by the project that provided propagation material, literature and information on VGT, technical assistance, as well as continuous monitoring on their activities. Those theses covered vetiver aspects associated with propagation, ecology, agronomy and barrier efficiency. The workshop content was incorporated as part of the regular soil and water conservation course, at undergraduate and postgraduate levels, increasing in this way the audience exposed to the information and materials prepared for the workshops.

Meetings Participation

Another way of promoting VGT was through participating in different technical and scientific meetings. These meetings were also a good opportunity for exchanging experiences and ideas on soil conservation and environmental issues. The most important meeting was the Workshop on Bioengineering held in El Salvador on May 1999, organized by the Latin American Vetiver Network, LAVN. Other meetings attended, where we participated with presentations related to vegetative grass technology with emphasis on vetiver, were the 10th International Soil Conservation Conference in Indiana, USA in May 1999, and the Interstate

Watershed Council which met in Maracay, Venezuela in July 1999. In all these meetings the applications and efficiency of vetiver for different purposes were highlighted. VGT expositions during these meetings and at other special events using three dimensional displays, and live material combined with multimedia aids appeared to be effective and caused big impact among the visitors. In Eureka'97, a national exposition on innovations and technology, SCA stand was awarded, and the author who is the leader of the Vetiver Project, received a prize on Academic Innovation granted by General Motors of Venezuela in recognition of his research and academic work on VGT.

Gathered Experience and Future Expectations

SCA has gained experience in promoting VGT in Venezuela, and nowadays, is more confident about VGT and the benefits that the country can obtain from implementing this technology. The main achievements reached during the two-year project (1997-99) can be summarized as follows:

- The different strategies to promote vetiver grass technology were successful. Among them, the workshops were the most intensively used because they were needed to introduce the technology to many potential users for the first time.
- Three different demonstration sites were developed in diverse agro-ecological conditions. VGT proved to be an effective alternative for erosion control and environmental protection in all of them. VGT has a high potential for adoption among farmers and at the same time, to help develop sustainable land use systems.
- International cooperation through The Vetiver Network and the Latin American Vetiver Network were key elements for success, not only financially, but in terms of technology transfer and shared experiences.
- Local institutions (governmental and non-governmental) demonstrated the advantages of working together sharing resources and strengths. Volunteer students participation was also a key element to disseminate VGT. Students also benefited from the opportunity to get additional training.

Some aspects must be taking into account for future projects to get even better results than the ones obtained by SCA. First of all, two years may not be enough time, especially if establishing a nursery is needed. Three to five years would be the optimum period. Local and international financial support must ensure a longer term for the project. One of the major constraints faced during our experience was the occurrence of major political changes that affected national and local institutions during the project period. The uncertainty created by the political changes avoided a wider and stronger commitment of public and private agencies to introduce new and innovative programs. Our successful experience lead us to believe that once this transition is overcome in Venezuela, we will be able to continue our efforts in a more productive and effective way.

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