

AGROBIODIVERSITY FAIRS. A METHODOLOGICAL GUIDE FOR THEIR ORGANIZATION AND DEVELOPMENT IN CUBA

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ABSTRACT. Local Agrobiodiversity Fairs started in Cuba late in 1999 by the I Maize Fair celebrated at the National Institute of Agricultural Sciences (INCA), signed up by the Cuban Project of Participatory Plant Breeding (CPPPB). This methodological guide was motivated by the significance of agrobiodiversity fair development on the varietal base diversification supporting food security and growers' market as well as its further generalization in different crops and regions of the country. The objective of such a guide was to share the experience acquired by a staff of researchers from INCA, in such a way that it permits to preserve and widen plant genetic resource diversity of Cuban growers. The document is subdivided into two main sections: the first one which is entitled "General comments on agrobiodiversity fairs" gives a summarized information about different topics, as definition and kinds of fairs, experiences got on fairs in other countries, agrobiodiversity fairs celebrated in other countries, in Cuba and terms associated to them, whereas the second section refers to a strictly detailed way of organizing and developing fairs in our country, so that the reader may find the exact information of the most important aspects to be taken into account. Every subject is logically arranged to provide an easier work to readers.

RESUMEN. Las Ferias Locales de Agrobiodiversidad en su sentido más amplio se inician en Cuba a finales de 1999, con la celebración de la Primera Feria de Maíz en áreas del Instituto Nacional de Ciencias Agrícolas (INCA) enmarcada en el Proyecto Cubano de Fitomejoramiento Participativo (PCFP). Como respuesta a la importancia que el desarrollo de las Ferias de Agrobiodiversidad tienen en la diversificación de la base varietal sobre la que se sustenta la seguridad alimentaria y de mercado de los agricultores cubanos y sus perspectivas de generalización en diferentes cultivos y regiones del país es que se ha tenido a bien la elaboración de la presente guía metodológica, con el objetivo de compartir las experiencias adquiridas por un colectivo de investigadores del INCA, de manera que en alguna medida pueda con ello contribuirse a la conservación y ampliación de la diversidad de los recursos fitogenéticos de los agricultores cubanos. El documento se halla subdividido en dos secciones principales. En la primera, "Generalidades sobre las ferias de agrobiodiversidad", se ofrece una información resumida sobre tópicos tales como: definición y tipos de ferias, experiencias en el desarrollo de ferias en otros países, las ferias de agrobiodiversidad en otros países, las ferias de agrobiodiversidad en Cuba y términos asociados a estas, mientras que en su segunda sección, se presenta lo más detalladamente posible la guía para su organización y desarrollo en Cuba. A lo largo de la misma, el usuario puede hallar información precisa sobre los principales aspectos a tener en cuenta. En el orden de presentación de cada aspecto contemplado se ha tratado de mantener un orden lógico de organización de modo que facilite aún más el trabajo de los usuarios.

Key words: plant breeding, community involvement, biodiversity, methods

Palabras clave: fitomejoramiento, participación comunitaria, biodiversidad, métodos

INTRODUCTION

The well-known Agrobiodiversity Fairs started in Cuba over the late 1990's, as an important working tool of participatory plant breeding (PPB), mainly aimed at

enabling seed flow from a given research institute to any farmer and viceversa (1).

Taking into account the evident successes and characteristic errors of any new action undertaken, agrobiodiversity fairs carried out with significant crops for Cuban feeding, such as rice, bean, maize, tomato and pumpkin, have been developed in Havana and Pinar del Río provinces. At the beginning, fairs were organized and developed by researchers pertaining to the participatory plant breeding project from the National Institute of Agricultural Sciences (INCA); however, at present, farmers

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have become the main organizers and proved their capacity to mobilize local actors.

Undoubtedly, both the organization and development of fairs based on a wide and active participation of farmers to select their own varieties, have evolved into an interesting mechanism towards the most harmonious integration of breeders' knowledge and farmers' abilities in the search for practical solutions to growers' need of species and varieties (2).

Considering the significance of such events on the diversification of a varietal base to support food security and farmers' market in Cuba, besides gathering their own experience, this report was written with the objective of providing the possible clients with some reference information, so that they can learn the basic principles to adequately celebrate agrobiodiversity fairs.

As a result of its close relationship with the subject, this paper was divided into two main chapters: a first chapter with general information on different aspects, for instance: concept and different kinds of fairs, general traits of every fair celebrated in other countries and those named Agrobiodiversity Fairs performed in Cuba. At the end of the chapter, you may look up some terms referred to fairs. In turn, the second chapter is fully devoted to the guide as such.

This guidebook, based on the practical experience gathered by PPB research staff from INCA, presents some considerations and elements which should be taken into account with flexibility, to get an adequate arrangement and development of fairs. Whether possible, a logical order of subject presentation was followed, with the purpose of giving the readers more possibilities of practical application.

GENERAL COMMENTS ON FAIRS

Definition of fair

According to the broadest concept of fairs found in UTEHA Encyclopedic dictionary (3), they are defined as periodical meetings of purchasers and vendors in established places and dates, in order to perform trade transactions, which was the prevailing form until the XVIII century. The fair differs from the market because the latter is permanent, whereas the fair length, wholesale trade and solemnity are its distinctive features.

Even Sampling Fairs are distinguished as a modern facility showing diverse goods, sometimes arranged in some cities with international nature, in order to intensify trade exchange. They usually count on governmental support, chambers of commerce, etc.

Concerning this wide concept, it is possible to discern the existence of different kinds of fairs, mainly determined by their own goals, which are listed as follows:

- ♦ *Variety Fairs*. They are those aimed at showing or selling a rather wide group of varieties derived from one or more crop species. According to each species or varietal particularity, they can be based on seeding under field conditions or showing living samples of them. The former

ones give the participants the possibility of evaluating the behavior of every material presented, so enabling to a more effective selection of them.

- ♦ *Seed Fairs*. They are those aimed at showing a wide diversity of seeds derived from one or several species. The selection of the best materials is just based on grain characteristics, so limiting the most effective selection of materials.
- ♦ *Fruit Fairs*. They are those aimed at showing fruits from determined species, giving the inherent limitations to develop any other kind of fairs. They are characterized by fruit species, pumpkins, melons, etc.
- ♦ *Variety and Seed Fairs*. They are those aimed at showing a varietal combination in field seedings and its corresponding seeds, which becomes into the most effective alternative for selecting determined grain species, among others, by harmoniously mixing criteria about the whole performance of plants and seed quality.
- ♦ *Variety and Fruit Fairs*. Similar considerations to the previous ones are valid for determined species as tomato, which demands entire criteria on plant performance and fruit quality for an efficient selection.

Taking into account the experience mainly acquired by arranging and developing fairs of varieties, of varieties and seeds and of varieties and fruits, besides considering their adequacy to the main crops filling the basic feeding basket in Cuba, from now on the attention will be directed to the latter ones.

Experiences acquired after developing Agrobiodiversity Fairs in other countries

From the agricultural point of view in particular and encouraged by the growing need of preserving and increasing diversity of the existing species and crop varieties, similar meetings have been developed in different regions of the world based on a wide diversity of crops and varieties in each region or country.

In this way, Seed Fairs have been increasingly developed in countries such as Zimbabwe, where most farmers have to earn their livings in the agricultural sector (4). Such fairs, promoted by the technical collaboration project between the Developing Community of South Africa (SACD) and Germany, "small-scale seed production promoted by self-helped teams", performed on the basis of each community showing samples from crop seeds and local varieties, have served for:

- ♦ enabling exchange of experiences concerning yield of several varieties
- ♦ enabling farmers' access to many crops and varieties accomplishing their food requirements
- ♦ raising a competitive spirit in food production
- ♦ sharing abilities and knowledge of how to obtain crops.

On one hand, in Los Andes from Peru, fairs of exchange and sale and competitions belong to its tradition and explain why biodiversity fairs and contests are so welcomed by farmers (5). The idea of presenting landraces pertained to the anthropologists Gordon Prain and Norio Yamamoto and the agronomist Fulgencio Uribe, around

1987-1988, after observing that each family and community kept their own varieties. The first landraces presented belonged to farmers from Libertad and Aymar , both towns in the Center of Peru. Here emerged the fair spirit so the first one was celebrated in San Jos  de Aymar  in 1989, a community located in South Huancayo. It was arranged by farmers, besides the NGO SEPAR and CIP/INIA/COTESU agreement collaborated with it. Two important and surprising fairs were presented on the basis of an inventory of species and varieties besides communities and families of the region showing them.

The great enthusiasm of farmers to participate in this kind of fair, their role in recognizing and promoting knowledge, besides the local arrangement to manage genetic resources let us suppose the fairs will form part of the agricultural schedule in Los Andes from Peru in future years.

Seed fairs are nothing new in Nepal; however, the commercial seed sector tendency finishing seed exchange among smallholders certainly is (6). Thus, the community has made the arrangements to develop diversity fairs with politicians, farmers and children from the community as well as research directors, plant breeders and workers in general.

The exposition of several species and varieties, a distinctive characteristic of the already celebrated fairs presents a wide genetic diversity supporting food security in Nepal. In this way, according to the author himself, diversity fair has created a new conception of the significance of diversity among villagers and have revealed new possibilities of economic expansion.

Agrobiodiversity fairs in Cuba

In Cuba, agrobiodiversity fairs are the meetings celebrated on the farm among farmers, plant breeders, political decision makers, germplasm bank preservers and farmer organization leaders, with the purpose of contributing mainly to maintain and increase biodiversity in economically interesting crop varieties and species through participatory selection, in such a way that farmers can satisfy their family's consumption needs as well as marketing demands as an income supply of new resources.

Along with the Participatory Plant Breeding Project developed at the National Institute of Agricultural Sciences, an Agrobiodiversity Fair movement started in the two western provinces of our country over the late 90's, where a broad varietal diversity of important crops, such as, bean, maize and rice, were presented.

Agrobiodiversity fairs in Cuba have been distinguished for the following items:

- ◆ presentation of a wide varietal diversity including commercial and precommercial varieties, advanced lines and local varieties
- ◆ participatory selection of varieties according to their performance in field seedings
- ◆ initial arrangement and development of fairs by plant breeders; further fairs are gradually organized by local farmers

- ◆ farmers are guests with the aim of selecting the most adequate five or six varieties or lines, with respect to their land characteristics, consumption needs and marketing demands
- ◆ fair organizers surely deliver few seeds from each material selected by the farmers to be evaluated under their own production conditions
- ◆ women's active participation in the process of selection and preservation of materials
- ◆ exchange of knowledge and experiences among participants concerning the management and preservation of genetic resources.



Photo 1. Biodiversity fair of maize in Cuba

Undoubtedly, agrobiodiversity fairs are characterized as an important way to channel the necessary seed flow from rich regions to those where seeds are not available (1). Likewise, it becomes an important complement of the breeding programs conducted with various crop species, in such a way that by means of the participatory selection of new genetic materials, it is possible not only to reduce the required time for new varietal extension to a minimum, but also to perform a more effective varietal selection for every specific condition.

Terms associated to agrobiodiversity fair development

Biodiversity. According to the Biological Diversity Agreement of 1992 (7), "biological diversity" is defined as the variability among living organisms including terrestrial, maritime and other ecosystems as well as ecological complexes conforming them; it comprises diversity within species, between species and ecosystemic diversity, whereas in general terms, it is defined as life diversity on Earth. The abbreviated term "biodiversity" was hardly known before 1988; however, today it is a usual term, a popular word in fashion employed by politicians, citizens and the means of communication all over the world. Biodiversity plays a significant role in our daily life; 40 % of the world economy is based on products and biological processes.

According to Altieri, biodiversity is a basic concept to manage and plan landscapes. It is the result from historical processes; thereby, it refers to those processes related to time and space. Man's activities may disturb or

keep biodiversity, depending on man-nature interaction, particularly by agricultural practices.

Agrobiodiversity. This term can be defined as that portion of biodiversity which the man depends on to obtain food, fuel and fiber including plants, animals, trees and other organisms that have direct significance on agricultural production (8).

Participatory varietal selection (PVS). It is farmers' selection of fixed lines (released to the market, advanced lines or landraces) under their defined environments by applying their own selection criteria (9).

To attain a successful PVS, these four steps should be followed:

- ☞ identification of farmers' needs that should be satisfied by a cultivar
- ☞ search for adequate materials
- ☞ test its approval in farmers' fields
- ☞ greater diffusion of favorite farmers' cultivars.

Some authors (10) classify selection according to the actors and place, such as:

- ➔ *Nonparticipatory selection*. It is performed by breeders.
- ➔ *Participatory selection*. It is performed by farmers.
- ➔ *Centralized selection*. It is performed at research stations.
- ➔ *Decentralized selection*. It is performed at farmers' lands.
- ➔ *Nonparticipatory centralized selection*. It is performed by breeders at the research stations.
- ➔ *Participatory centralized selection*. It is performed by farmers at the research stations.
- ➔ *Nonparticipatory decentralized selection*. It is performed by breeders at farmers' lands.
- ➔ *Participatory decentralized selection*. It is performed by farmers in their own lands.

Participatory plant breeding (PPB). It is a breeding process (9), by means of which farmers along with breeders select segregating material cultivars under defined environments. According to this, a successful PPB should follow these characteristics:

- to understand why different varieties should be cultivated
- to identify skilled farmers that are capable of managing diversity and seed selection
- to establish breeding goals together, as well as functions accomplished by participants to satisfy farmers' needs
- to employ local varieties as parent material
- to conduct a decentralized selection of segregation lines by farmers
- to let farmers participate in all selection and evaluation stages
- to transfer abilities and knowledge between farmers and plant breeders
- to let scientists evaluate and monitor varietal spreading besides using informative systems of seed supply to widen diffusion.

Selection environment and target environment. According to some criteria (10), a selection environment is defined as the one under which varieties are selected and its number is usually lower than the number of target

environments, particularly where the early selection of segregating material is performed. On the other hand, target environment is defined as the one towards which selection is performed.

According to Falconer (10), the most efficient selection occurs under target environment (or identical environments to the target one).

Facilitator. This is not the one who teaches the people what to do but an allied person who shares experiences and supports them to get out the best of his riches (11).

Local varieties. Crop varieties developed by farmers that have been adapted to local environmental conditions (12).

METHODOLOGICAL GUIDE FOR ARRANGING AND DEVELOPING AGROBIODIVERSITY FAIRS IN CUBA

Introduction

Taking into account the significant role that agrobiodiversity fairs have played to preserve and increase diversity of economically important species and varieties for farmers and producers in general, besides the interest of the latter ones to celebrate this kind of event and the experience acquired by researchers and farmers have let us prepare the present paper, as a working guide or reference material for a better arrangement and development of fairs.

This guide shows, through a simple and practical way, the main aspects that should be taken into account for arranging and developing agrobiodiversity fairs efficiently in Cuba, specifically fairs of varieties and seeds as well as of varieties and fruits, since they are more adequate to those crops that mainly form part of the basic feeding basket in our country.

Main aspects that should be concerned in fair arrangement

Objectives and expected results

The objectives for developing a fair constitute the main aspect to be defined to reach an adequate organization. In this way, they should be clearly and accurately stated, so that the work as a whole can satisfy them.

Once the objectives are defined, the next step consists of establishing the results expected from the fair. Likewise, they should be quite specific to be evaluated at the end.

When defining both, two fundamental elements should be taken into account:

- ▲ foreseen time schedule
- ▲ social and economical development impact.

In this way, either objectives or results can be outlined while celebrating the fair, whereas others can be foreseen for longer time.

Concerning the social and economical impact, both the objectives and expected results have to be focused, so that fair celebration contributes to a harmonious and integral development of farmers' communities.

Crop that will be presented

The crop selected to be shown in the fair is closely related to its objectives and becomes a determining aspect for their successful accomplishment. The two following basic principles have to be fulfilled when choosing a crop:

- ★ the crop presented must be among the most important ones developed by farmers in the area where the fair is going to be celebrated, considering family consumption and marketing needs.
- ★ available varietal diversity to satisfy farmers' expectation.

If there is not a wide diversity of materials, it is necessary to collect them before fair celebration, so that they can be multiplied, also to guarantee a higher uniformity of seeds that will be sown at the exposing area.

Some other possible materials to be presented are:

- ◆ local varieties
- ◆ prospectations from other areas of the country
- ◆ commercial varieties
- ◆ introduced varieties
- ◆ advanced lines derived from breeding programs.

Kind of fair

Another important element with regard to fair arrangement and development is to determine the kind of fair to be celebrated. It should be defined in such a way that enables a complete fulfillment of the outlined objectives, taking into account the individual characteristics of the crop to be exposed.

In particular for grain crops, as bean, rice, maize, soybean and others, fairs of varieties and seeds are successful, because of the possibilities they bring the participants to observe the agronomic performance of exposed materials and grain quality, which are highly appreciated elements by farmers when selecting new materials.

For most crops, local fairs are recommended to promote a wide participation of farmers.

Once the target crop and the kind of fair are established, maybe it is convenient to present a sample of the products from national entities to be further applied to the crop in question.

Participants

When selecting the persons in charge of fair development, we should have in mind that fairs basically propitiate an informal seed flow among farmers, in such a way that the existing agrobiodiversity is not only kept but should be widened. Based on this principle, when selecting participants, there must firstly be a wide participation of farmers from the region where the fair will be celebrated. Also there is another important element to be considered: farmers from different regions should participate in the fair, with the purpose of establishing the basis for a higher diffusion of varieties and results from the fair. Besides, it is recommendable to invite especially other farmers, taking into account their production as well as the diversity of varieties and species cultivated.

Besides, executives from other organizations related to local agriculture have to be considered, as well as some employees who may lead to achieve the objectives.

When celebrating fairs with bean, maize, rice and tomato, as many as 50-60 farmers and 5-10 representatives from different organisms, including research centers, are suggested to participate, as an adequate top amount of people developing fairs.

Organizing committee

Since an adequate fair arrangement is very important for the successful fulfillment of its objectives, it is necessary to create an organizing committee to coordinate and develop everything.

In short, there are four main responsibilities that the organizing committee should have in mind:

General organizer. A person with deep knowledge and organizing capacity. His main responsibility consists of coordinating all activities to be developed within the fair by means of checking, controlling and systematically supporting them. In the fair, he should establish the corresponding contacts with organisms, enterprises, farmer associations, agricultural cooperatives or any other productive units, with the aim of obtaining the financial support required. He should also establish the corresponding contacts with the national entities of interesting productions for crop development.

Responsible for assembling the exposing area. His main responsibility is to guarantee the adequate assembly of the exposing area. He should adequately manage the exposing crop characteristics, so that he can appropriately make his own decision in each case. He will have as many supporting persons as necessary.

Responsible of information. One of the most important tasks for the successful fair development consists precisely of spreading information. If it is well done, the fair will have a great representation of farmers and other personalities. Having in mind that the main goal of fairs is to help widen the existing biodiversity in farmers' lands, an adequate information is needed, so that a considerable representation of them can attend the fair.

In this way, the responsible of information must start his work ahead of time, so that the information reaches each farmer and other personalities.

Diverse ways of spreading information are given by brochures, oral invitations and the radio. The traditional channels of communication in the community are really effective: farmer and social organizations of the community.

Responsible of material insurance. He manages different material resources, which are necessary for the successful fair development.

Responsible of cultural activities. He should contribute to enhance the cultural traditions of the region. Thus, he will look for the support of the participants with abilities for singing or performing in amateur groups of the area or any other more appropriate region to agricultural activities. In general, he contributes to develop all farmers' initiatives.

Financial resources

The financing search or management undoubtedly constitutes a determining element for the assembly and development of fairs. With the purpose of obtaining the necessary financing, the organizing committee should mainly get support from different organisms, enterprises and farmer associations, as well as agricultural cooperatives and other productive units from the region where the fair will be celebrated. Another possible alternative could be the contribution granted by nongovernmental organizations (NGO).

Crop developing stage

An important organizing task is the selection of the right crop developing stage for the fair, due to its influence on farmers' selection process.

In general, the most adequate time for celebrating fairs is close to harvesting time, when the selector can have an accurate evaluation of the productive performance of all materials exposed.

In most economically important crops, the tolerance level of varieties against pest and disease attacks is an excluding selection criterion; therefore, implementing two up-scale sowings could be an alternative to be considered, which will enable the participants to evaluate over two different stages the tolerance level of each material under natural production conditions, as well as other interesting characteristics that can not be appreciated closed to maturity season.

For those cases in which practical reasons determine the convenience of seeding just once, what is more recommended is to celebrate the fair near crop harvesting time, thus, giving the participants as more information as possible with regard to the tolerance level of every variety exposed to attacks of the main pests and diseases.

Now, there is a summary of the main sowing seasons, developing stages and crop ages, which are appropriate to celebrate agrobiodiversity fairs (see the table below).

Main sowing seasons, appropriate crop developing stages and ages to celebrate agrobiodiversity fairs

Crop	Sowing season	Developing stage	DAS ¹
Bean (<i>Phaseolus vulgaris</i>)	August-September	Maturity	65-70
Bean (<i>Phaseolus vulgaris</i>)	November-December	Maturity	65-70
Bean (<i>Phaseolus vulgaris</i>)	January	Maturity	65-70
Soybean (<i>Glycine Max. Merr</i>)	April-May	Maturity	70-75
Soybean (<i>Glycine Max. Merr</i>)	July-August	Maturity	70-75
Soybean (<i>Glycine Max. Merr</i>)	December-January	Maturity	70-75
Rice (<i>Oriza sativa</i> L.)	April-May	Maturity	110
Rice (<i>Oriza sativa</i> L.)	December-January	Maturity	130
Tomato (<i>L. esculentum</i> Mill.)	September-January	Early flowering	60-70
Maize (<i>Zea mays</i> L.)	April-May	Maturity	70-80
Maize (<i>Zea mays</i> L.)	September-October	Maturity	70-80
Sugarcane (<i>S. sp.</i>)	January-April	Maturity	360
Sugarcane (<i>S. sp.</i>)	May-June	Maturity	540
Sugarcane (<i>S. sp.</i>)	July-October	Maturity	420

¹DAS: Days after sowing

²Days after transplanting

Area for fair assembly

Once the crops to be exposed are defined, the next step consists of selecting a specific area to celebrate the fair; ahead of time the necessary conditioning practices

should be conducted, including soil preparation for seeding or planting as well as some other cultural practices.

The area for fair assembly must have the following characteristics:

- ◆ Uniformity of soil, which is an essential requirement for the area, in order to avoid differences among varieties as a result of other factors far from varietal own characteristics. So, the selected area must be on the same kind of soil with a uniform relief. Just in case it is not accomplished, it is recommended to repeat varieties at least in two plots or rows, so that their behavior can be accurately evaluated.
- ◆ Representative of most farms belonging to the area, so that it guarantees a high degree of adaptation to the selected varieties under specific conditions. It is better to select an area close to a notable farmer's land due to its diversity of species and varieties as well as for the level of satisfying feeding and marketing needs, which will be a good example to be imitated or surpassed by the rest of farmers.
- ◆ Accessibility of the area to every participant, to guarantee their possible attendance.

Soil preparation and assembly of the exposing area

These aspects must secure the observation of the following two basic premises:

- ◆ crop development under very similar conditions to the ones existing in most farms of the region
- ◆ varietal differences should respond to each of their own characteristics.

In this manner, while soil preparation and assembly of the exposing area, the following aspects should be considered:

- ◆ soil preparation, application of irrigation, fertilizers and other products should be uniformly done across the exposing area
- ◆ the new exposing varieties should come from different origin, for instance: local varieties, varieties collected in other regions, commercial varieties, advanced lines derived from classical breeding programs and introduced varieties.
- ◆ seed uniformity with regard to age, quality and origin
- ◆ all exposing varieties must be sown at the same date
- ◆ plots and rows should consider free access to participants when selecting varieties
- ◆ all varieties must be represented at the same seeding area with at least two repetitions
- ◆ every variety is separated from the others in the plots and rows, to avoid the possible effect of varietal competition
- ◆ varieties should be identified by already-established keys to avoid farmers' prejudice at the participatory selection process
- ◆ sample presentation of seeds, fruits and others, according to the exposing crop characteristics, is recommended to secure the maximum information to participants for selecting the desirable varieties for their lands

- ♦ to identify the exposing area by hanging a banner out of the field entry with the main characteristics: area outline, kind of soil, sowing date and crop age, the most important cultural practices, irrigation, fertilization, etc
- ♦ to adequate the area with characteristic elements of the zone to make it look splendid.

Preparation of documents

Prior to fair development, a group of papers should be ready, which are as follows:

Fair call. Foldings containing brief information on the general characteristics of fairs should be prepared and delivered. The information should include fair goals, the crop, amount of varieties, exposing material, date, place and time schedule.

Contest call. It is aimed at promoting different ways of presenting and consuming the target crop, which enables an exchange of experiences and cooking abilities among participants, who could be advised ahead of time. This contest call may appear in the fair call.

Participant control. This is the most important paper for the development of fairs, which contains all information for localizing and further delivering seeds from the selected varieties. So, one or two persons must be appointed as registering people. This is an example of the form for participants' control.

AGROBIODIVERSITY FAIR. BEAN' 2003 PARTICIPANTS' REGISTRATION

Full name	Private address
Francisco Pérez Sánchez	Finca "La Milagrosa" Municipio La Palma, Pinar del Río
Leoncio González Cruz	Finca "El Algarrobo" Municipio La Palma, Pinar del Río
Mario Martínez Rodríguez	Finca "El Naranjal" Municipio San José de las Lajas, La Habana
Luis Sánchez Sánchez	Finca "El Corojo" Municipio San José de las Lajas, La Habana
Rubén Florido Hernández	Finca "Los Cocos" Municipio Guira de Melena, La Habana

Selected varieties registered. This registration constitutes the basic working document for the participatory selection process. On it, every farmer states which varieties are more adequate for his specific land characteristics. This form should be delivered among farmers before varietal selection process; it contains the following data:

- ↪ selector's full name
- ↪ gender
- ↪ working center or farm name
- ↪ working center or farm address
- ↪ private address
- ↪ telephone
- ↪ selected varieties
- ↪ criteria for selection.

The requested information should be simple and legible for farmers. Once selection is over and the forms filled by farmers, the organizing committee collects them for their further processing. So the forms must be consecutively numbered to identify each farmer. An

example of this form of varietal registration appears as follows:

AGROBIODIVERSITY FAIR. BEAN' 2003. VARIETAL SELECTION REGISTRATION

Full name: Francisco Pérez Sánchez Order No.: 1
 Sex: _x_ m _____ f
 Working center: Finca La Milagrosa
 Work address: Finca La Milagrosa, Municipio La Palma, Pinar del Río
 Private address: Finca La Milagrosa, Municipio La Palma Pinar del Río
 Telephone: No
 Selected varieties and criteria for selection:
 Key: 8 High number of pods per plant, small grains
 Key: 9 Resistance to pests and diseases and high yield
 Key: 16 High number of pods per plant, grain color and size
 Key: 18 Disease resistance, pod and grain number
 Key: 19 Disease resistance and grain color
 Key: 20 Branch and pod number per plant

Summary of selected varieties. Once field selection is over and the forms gathered, the next step is the summary of all information by the organizing committee.

It is important to establish a relationship among those varieties presenting a higher level of approval during the fair.

To summarize as much information as possible for the participants, a double entry table is suggested, placing in the first column the consecutive number identifying each farmer whereas in the first row also the consecutive number and the keys to identify the varieties or lines exposed, where the selected varieties are marked with X. This information will be a basic document for two main purposes: firstly, to identify farmers with his selected varieties or lines; secondly, to determine which varieties or lines are preferred by farmers. It should be informed at the fair end.

This is an example of the summary table of the selected varieties:

SUMMARY OF SELECTED VARIETIES. VARIETIES EXPOSED

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1								x	x							x		x	x	x
2					x	x				x					x	x				x
3						x	x	x			x					x			x	
4							x	x		x			x		x	x				
.																				
.																				
n																				
T																				

n – Total number of farmers

T- Farmers selecting a variety

It is interesting to point out the varieties accepted by farmers. To make this information easier, the following summary table is recommended, which contains: variety key and name, amount and percentage of persons selecting them. Percentage is calculated on the total amount of participants selecting varieties.

MOST REMARKABLE VARIETIES IN THE FAIR

Key	Name	Selected times	Selection percentage
8	Selección Felo	95	63.3
16	"Criollo"	60	38.0
9	Criollo dentado 6	40	26.7
18	Pajicama 9	35	23.3

THE MAIN ASPECTS THAT SHOULD BE CONSIDERED WHILE DEVELOPING A FAIR

Fair opening

A general coordinator or another member of the organizing committee should be in charge of opening the fair. After opening and saying welcome to every participant, a complete information should be given about fair characteristics, which appear as follows:

- * main objectives of the fair
- * introduction of the organizing committee
- * acknowledgment to institutions or sponsored agencies
- * participants' origin
- * fair program: activities and schedule
- * main characteristics of the area and the exposing crop
 - ⇒ kind of soil: main characteristics
 - ⇒ sowing or planting date: age
 - ⇒ cultural practices or irrigation applied
 - ⇒ pest and disease control
 - ⇒ distribution and identification of varieties at the exposing area
 - ⇒ sample organization of seeds, fruits, etc.
- * about selection
 - ⇒ significance of participatory varietal selection
 - ⇒ arrangement for field selection
 - ⇒ registration forms for the selected varieties
 - ⇒ maximum number of varieties selected per farmer
- * procedure to deliver seeds from the selected varieties to participants
- * persons working as facilitators
 - ⇒ introduction
 - ⇒ functions
- * arrangement of other activities
 - ⇒ contest development
 - ⇒ program of cultural activities.

Participatory varietal selection

Undoubtedly, it constitutes the most relevant activity during fair development, since farmers select the best varieties according to their own opinion and needs for family's consumption and harvest marketing. A previous journey across the area is recommended, so that the farmers can have a general idea of the complete varietal behavior.

Later on, participants are divided into groups to individually start their selection at different places, in order to avoid too many persons together, also to make individual selection process easier. Thus, facilitators play their role at this stage to explain any question among selectors. After that, each group chooses their own facilitator.



Photo 2. Participatory varietal selection

Participatory analysis of the problems related to seed production and preservation

Once field selection is over, crop problems with regard to seed production and preservation are analyzed in full session, which is an alternative for arranging and developing agrobiodiversity fairs. Therefore, these fairs must have a minimum comfort for the participants.

Facilitators will support their work on one or two decision makers to record all statements or criteria during the participatory analysis. This information will serve the organizing committee to search for alternatives to the problems.

While celebrating the meeting, the facilitator will let the farmers talk spontaneously and freely.



Photo 3. Participatory analysis of problems per group

In this sense, a more profitable approach is the initial analysis of problems by working groups of 8-10 persons. Each group analyzes crop problems or any relevant subject separately. Each member says his opinion freely and all criteria are later summarized by a decision maker appointed by each group. Once the time is over, each group presents and analyzes the summary in full session.

Evaluation of tasting qualities

It is another alternative to be taken into consideration when organizing and developing agrobiodiversity fairs, since they are very important qualities considered a basic criterion for selecting varieties.

With regard to crops devoted to people's fresh consumption, the evaluation of tasting qualities is extremely simple; however, in rice and beans, it depends

on a previous cooking process to evaluate such qualities appropriately. In both crops, an alternative could be a single sample preparation of varieties selected before celebrating the fair, in order to observe yield, tolerance level against pests and diseases, according to each crop characteristic.

An essential requirement in any case is the application of a very similar treatment to each sample exposed. Like in the case of exposed varieties, those samples dedicated to tasting tests will be identified by a key that agrees with that used to identify field variety, so that the selector may consider it as another opinion in the selection process.

Selecting the place for the fair depends on the target crop characteristics. For fresh consumption crops, it is more adequate to put samples in their own plots or rows near the corresponding variety, whereas in others, it is more convenient to expose them closer to the exposition area, with a minimum of conditions for selectors.

In relation to the characteristics and relevance of any fair, the sample exposition of products from national entities aimed to develop agricultural production, especially the target crop of the fair, may constitute an interesting alternative to promote them among farmers.



Photo 4. Tasting test

Contest development

It has become another interesting alternative to be considered while organizing fairs, in order to exchange experiences and abilities among participants in cooking typical dishes with the target crop of the fair.

To develop the contest, they must look for a place in the exposition area or closer to it, so that all participants can get together. Samples are anonymously presented, identifying each one with a key established by the organizing committee. Samples will be evaluated by a commission made up of the same amount of men and women, all elected by participants themselves.

Samples selected will be awarded if surpassing a group of known parameters, such as: crop participation rate in the sample, originality and presentation. The organizing committee will give a prize to each category selected.



Photo 5. Dish contest

Fair closing

It is an important moment of the fair, since a general balance of the whole work is presented according to the initial objectives stated.

The main aspects considered when closing biodiversity fairs are as follows:

- ◆ farmers' identification with the varieties selected
- ◆ summary of the most selected varieties
- ◆ list of adopted agreements
- ◆ delivery of contest prizes
- ◆ general evaluation of the outlined objectives fulfilled.

Cultural activity

It is considered an appropriate way of socio-cultural development of farmers' communities. While celebrating this kind of activity, there must be a chance for farmers' cultural traditions, for instance, soloists, music bands or farmers' improvisation.

REFERENCES

1. Ríos, H. and Wright, J. Primeros intentos para estimular los flujos de semillas en Cuba. *Boletín de ILEIA para la agricultura sostenible de bajos insumos externos*, 2000, vol. 15, no. 3-4, p. 37-38.
2. Soler D.; Cleveland, D. A. and Smith, S. E. Creando bases comunes en el mejoramiento colaborativo de los cultivos. *Boletín de ILEIA para la agricultura sostenible de bajos insumos externos*, 2000, vol. 15, no. 3-4, p. 20-22.
3. Diccionario Enciclopédico UTEHA, 1953, Tomo-IV. Des-Fer, 1247 p.
4. Neuendorf, O. Ferias de semillas: creando conciencia de una rica herencia. *Boletín de ILEIA para la agricultura sostenible de bajos insumos externos*, 2000, vol 15, no. 3 y 4, p. 24-25.
5. Scurrah, M.; Fernández-Baca, E.; Canto, R.; Olivera, E.; Núñez, E. and Zúñiga, N. Una muestra de biodiversidad y conocimiento en los Andes del Perú. *Boletín de ILEIA para la agricultura sostenible de bajos insumos externos*, 2000, vol. 15, no. 3 y 4, p. 26-28.
6. Sthapit, B. Feria de la diversidad inspira comunidad en Nepal. *GENEFLOW. 10 Aniversario. Una publicación sobre los recursos fitogenéticos de la tierra*. 1998, p. 11.

7. Grupo Crucible II. Siembra de soluciones. Tomo 1. Alternativas políticas en materia de recursos genéticos (actualización de gente, Plantas y Patentes). 2001.
8. Almekinders, C. and Boef, W. de. El reto de la colaboración en el manejo de la diversidad genética de los cultivos. *Boletín de ILEIA para la agricultura sostenible de bajos insumos externos*, 2000, vol. 15, no. 3-4, p. 5-7.
9. Sthapit, B. R.; Joshi, K. D. and Witcombe, J. R. Farmer participatory cultivar improvement: A case of high altitude rice from Nepal. *Experimental Agriculture*, 1998, vol. 32, p. 479-496.
10. Ceccarelli, S.; Grando, S. and Capettini, F. La participación de los agricultores en el mejoramiento de cebada en el ICARDA. En: Danial, Daniel L. *Memorias de la Conferencia Internacional sobre: Futuras estrategias para implementar mejoramiento participativo en los cultivos de las zonas altas en la región Andina*, 23-27 de septiembre del 2001, Quito, 2001, p. 25-54.
11. Rodríguez, R. and Hesse-Rodríguez, M. Al andar se hace camino. Guía metodológica para desencadenar procesos autogestionarios alrededor de experiencias agroecológicas. 1ª. Ed. Colombia, 2000. 213 p.
12. IPGRI. Variedades locales. *GENEFLOW. 10 Aniversario. Una publicación sobre los recursos fitogenéticos de la tierra*. 1998, p. 2.

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