African Organic Agriculture Training Manual

A Resource Manual for Trainers

9-8 BEANS

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June 2011

Ready for field testing

FiBL

IMPRINT

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FACTSHEET 8: BEANS

Learning targets for farmers:

- Learn good production practices of beans
- Understand procedure for selecting the most adaptable varieties
- Recognize possibilities for proper integration of beans in the local farming systems
- Learn organic approaches to pest, disease and weed management
- Learn the main requirements for organic certification of bean production

1 Introduction

Common Beans *(Phaseolus vulgaris)* belong to the very large family of Fabaceae (also called Leguminoseae), which includes food plants such as beans, peas, pulses, peanuts and soybeans. This chapter, however, will focus on the common beans only. Some important food crops from the Fabaceae family are:

Genus: Phaseolus (beans)	
Common bean	*Phaseolus vulgaris*
Runner bean (scarlet bean)	*Phaseolus coccineus*
Azuki bean	*Phaseolus angularis*
Lima bean (Butter bean)	*Phaseolus lunatus*
Green gram (Mung bean)	*Phaseolus aureus*
Genus: Viceaceae (vetches)	
Pea	*Pisum sativum*
Broad bean	*Vicia faba*
Lentil	*Lens culinaris*
Chickpea	*Cicer arietinum*
Cowpea	*Vigna sesquipedalis*
Genus: Glycine	
Soybean	*Glycine max*

HOW TO RECOGNIZE RHIZOBIUM NODULES ON THE ROOT OF LEGUMES

Common beans *(Phaseolus vulgaris)* can be differentiated into:

a. **Dry beans and green beans** - Common beans can be grown as dry (shelled) beans or green beans (also called French or haricot beans), whereby green beans are the unripe pods of common beans. Varieties suitable for shelling usually have larger seeds and bigger pods and the shelled seeds can be eaten either fresh or dried. Green beans have fleshy pods and should be harvested before the seeds are fully developed.

b. **Indeterminate (climbing) and determinate (bush) beans** - The indeterminate growth of climbing beans refers to growth that is not terminated while bush beans grow to approximately 50 cm and can be grown without support. Climbing beans are usually grown on a trellis and can easily grow 3 meters high or more. Because of the bigger plant volume, they have a higher yield potential than bush beans.

1.1 Advantages of incorporating beans into a cropping system

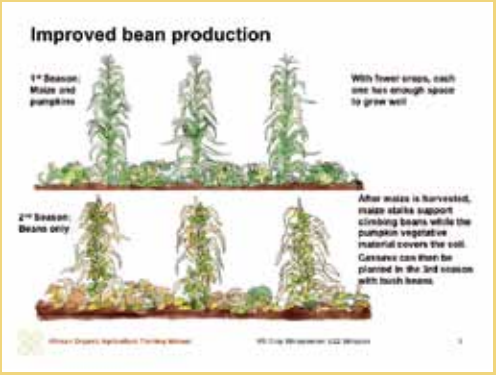
An important characteristic of beans, like other legumes too, is their ability to transform atmospheric nitrogen into nitrogen that can be taken up by plants. They do this with the help of Rhizobium bacteria that live in their roots. This property makes beans (and other legumes) an important element in crop rotations. They provide nitrogen not only for themselves, but also for the crops that follow.

The reasons to grow beans on small and medium sized farms are manifold:

- Beans, like other legumes, are a rich source of protein, carbohydrates, minerals and vitamins. Protein content in beans can reach up to 40 %, whereas the protein content of meat is approximately 20 % only.
- Beans are an important staple food in rural Africa and grown widely, only second to maize.
- Beans are relatively easy to grow on small pieces of land.
- Beans fit in very well into crop rotations and provide nitrogen to the crop that follows.
- Beans can be successfully intercropped with crops like maize or cassava.
- Dry beans can be stored and consumed or sold on the market according to need.
- Beans have big demand in both domestic and regional markets within Africa.

TYPICAL BEAN PRODUCTION SITUATION IN AFRICA

IMPROVED BEAN PRODUCTION



1.2 Challenges related to bean production in Africa

Despite all of the above mentioned benefits, bean production still faces a number of challenges in Africa:

- **Poor selection of bean seeds -** Although many farmers face difficulties in finding good yielding varieties suitable to local conditions, the handling of varieties is also very poor. Normally farmers mix up improved and local varieties in the same gardens, making it difficult to achieve full potential from improved varieties. The harvested beans are further mixed up after shelling and during further planting. As a result of cross pollination, the characteristics of improved varieties are gradually lost.
- **Poor quality of seeds -** Since virus infection of bean crops is widespread, the bean seeds farmers use for growing the next crop are often virus infested.
- **Soil degradation -** Bean production in Africa is severely constrained by low soil fertility. In Central and Eastern Africa, the major soil fertility related problems include low available Nitrogen (N) and Phosphorus (P) and soil acidity. Many areas have acid soils poor in nutrients while others are too arid for bean production. Soil erosion is another problem, especially in highland areas.
- **Poor husbandry practices -** Difficulties in finding suitable material for making a trellis for climbing beans limits the full productive potential of these beans.
- **Postharvest losses -** Especially during drying and storage, a significant amount of beans is lost through mould. This is a result of insufficient drying and the exposure of the dried beans to water or humidity during storage. Poor sorting of beans is another quality problem. Different varieties, sizes, stones and other waste from threshing are always found mixed with the beans presented to the market for sale.

The aim of this chapter is to introduce organic approaches that can be adopted according to the local conditions, in order to support a more sustainable and profitable production of beans.

Discussion on assessment of the local bean production situation

To assess challenges in local bean production ask the farmers the following questions:

- Are you familiar with bean production?
- Do you experience any of the above or other challenges?
- How have you tried to address those challenges?

2 Proper selection of planting materials

Common beans come in a tremendous variety; the pods can be green, yellow, purplish brown or striped and the seed colour varies from white to brown or black, red, striped, mottled or multicoloured. The main varieties for dry beans are Calima, Reds, Navy Bean, Cream Coloured, Brown and Yellow Coloured, Purple Beans, Medium Whites, Large Whites and Blacks.

The large number of varieties makes it difficult to decide which varieties to grow. Some of the varieties are indigenous while others are improved and each has its own traits. It is, therefore, necessary that a farmer identify a selected number of varieties that have been observed to be superior with respect to certain traits under local production conditions.

2.1 Choice of suitable varieties

The choice of the right variety depends on the market requirements, local growing conditions and the availability and quality of seeds.

a. Market requirements

- Multipurpose varieties: Varieties grown primarily for self-sufficiency are those that can be eaten as fresh green beans, fresh or dried seeds, and sometimes also the leaves. Multipurpose varieties are usually climbing beans or runner beans that can be harvested over a longer period of time.
- Green beans: In densely populated areas and those near towns, the demand for fresh green beans is high. Farmers can grow fresh green beans for the market. Such farmers are, however, advised to test any green bean varieties on a small plot before scaling up since most green varieties are very sensitive to growing conditions.
- Dry beans: Dried shelled beans can easily be stored. They, therefore, provide an important food in the off-season period and can be sold in off-season and distant markets.

Sharing experiences on available bean varieties in the area

To determine which types and varieties of beans are locally grown, ask the farmers the following questions:

- Which types of beans are commonly grown in the area, green or dry beans?
- Are there any new varieties that have been promoted in the area?
- How are the new varieties performing under local conditions?
- What do you consider when choosing bean varieties to plant?

IMPROVED BEAN VARIETIES RELEASED BY THE EAST AND CENTRAL AFRICAN BEAN RESEARCH NETWORK

Improved bean varieties released by ECABREN

b. Location

› Beans grow in temperate and warm climates alike. Very high temperatures though cause shedding of the flowers and malformed beans. On the other hand, drought reduces the cropping period and the yield.

› Before growing a new variety, it is necessary to verify where the variety comes from. Varieties growing on high altitudes may not grow well in low altitudes; varieties from arid areas may not grow well in humid areas. It is advisable to make tests on a small plot before scaling up production.

› Some varieties are better resistant to drought and are, therefore, more suitable for arid locations.

c. Seed availability and quality

Use of healthy seeds is important to ensure good development of the crop. Healthy seeds can be bought from trustworthy commercial suppliers that can guarantee virus and disease free seeds. If own seeds are used, they should be selected carefully in order to avoid spreading seed-borne diseases like bean mosaic viruses. When choosing a variety, in addition to its yield potential under local conditions, special attention must be given to resistance or tolerance to prevalent pests and diseases. Several tolerant bean varieties have been adopted by farmers and released in some countries.

Varieties	Country	Remarks
MAC 13, MAC 34, MAC 64	Kenya	Climbing beans
Ndundu, Manseki, Mpolo	D.R.Congo	Climbing beans
Sepe, Mbidi	D.R.Congo	Bush beans
Moore 88002	Burundi	Bush beans for low elevation and high humidity areas
Lyamungu 90	Tanzania	Bush beans for low elevation and high humidity areas
RWR 719	Rwanda	Resistant to common foliar diseases and root rots
MLB-49-89A, MLB-39-89A	D.R.Congo	Resistant to common foliar diseases and root rots
SCAM -80-CM/5	Burundi	Resistant to common foliar diseases and root rots
Beshbesh, Melkie	Ethiopia	Resistant to Bean stem maggot (bean fly)
RWR 2075, RWR 1946	Uganda	Resistant to root rot and tolerant to low soil fertility
RWR 1783, Calima type	D.R.Congo	Tolerant to soil acidity and low phosphorus
STTT165-92(Chore), RAB484 (Dinkesh), XAN310(MelkaDima), G843(Alemaya), STTT-165-96 (Chercher)	Ethiopia	Improved varieties

Source: www.ecabren.pabra.org

Recommendations to farmers regarding seed selection:
The following process can be done better as a group of farmers rather than an individual in order to identify the most suitable bean varieties for the given location:

- Collect all bean varieties in the area. These can be identified by the skin colour or growth characteristics.
- Separate seeds according to the identified varieties.
- Let each farmer take the same amount of one preferred variety and plant them at a selected experimental plot in the garden. Make sure that no other beans are planted within 100 metres of the experimental plot.
- All farmers should plant in the same season and manage the plots in a similar way. Proper monitoring during the growing period is important.
- Record all experiences with the variety (e.g. time to maturity, yield, pest and disease observations).
- Repeat the experiment for another season in different plots in order to confirm the results.
- Select the best varieties and discard the worst ones. Ensure that seed of different varieties are continuously separated in the field and in storage.
- Store selected seeds well; the beans should be well-formed without any signs of infection. Dry them to a good moisture level (hard but brittle when bitten) and mix with dried leaves of neem, marigold or any other botanical to keep off storage pests.

2.2 Treatment of seeds against infections

The use of chemical seed dressing is prohibited in organic agriculture. In order to prevent contamination of the seed with pathogens, seeds for propagation must only be taken from healthy plants and dried under optimal conditions. Bright sunlight has a certain disinfecting effect. Therefore, beans must be turned regularly during drying to benefit from the sunlight. Optimal germination conditions help the young plants overcome early infestations.

3 Proper field establishment

Beans are short term crops and grow very fast, especially green beans, which are ready to harvest 7 to 8 weeks after planting, while the dry beans are ready in 10 to 12 weeks. Beans, therefore, need proper attention and suitable growing conditions in order to maximise yields.

Preparing land by hand can be done with a hoe or a spade. Except in cases of noxious weeds like spear grass or couch grass, it is not necessary to completely turn the soil. Loosening and breaking up clods is sufficient. Stones, sticks and weed roots must be removed. If heavy animals such as oxen are used to till the soil, care must be taken to work the land only when it is dry.

Green bush beans should be sown in rows 60 cm apart and 10 cm between the plants for comfortable picking. Climbing beans should be sown in double rows and a larger spacing of 80 cm between rows and 100 cm between each double row.

3.1 Land preparation

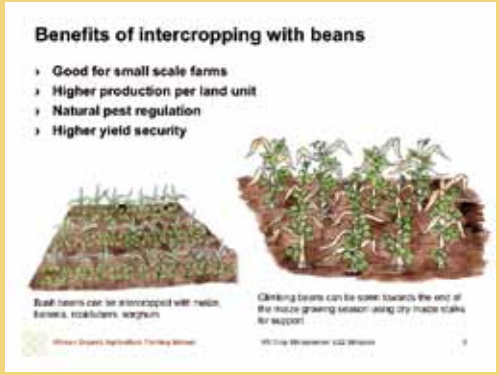
Beans can develop deep roots, provided that the soil is well structured. The soil should be loosened and any noxious weeds like couch grass *(Cynodon dactylon)* should be removed. If the plot was previously covered with weeds like *Amaranthus* spp, which produce a lot of seeds, then the land needs to be prepared early in the season. This will encourage most of the weed seeds to germinate as soon as the soil gets any moisture. They can then be lightly tilled down before beans are planted; very shallow cultivation is needed, only along the topsoil, to remove these weeds. Compost or animal manure should be added earlier during the first cultivation to allow for any weed seeds carried along to also germinate before the final tilling session before planting.

Sharing experiences on the establishment of bean gardens (bush and climbing beans)

Inquire about farmers' experiences with establishing a bean crop by asking the following questions:

- What are your experiences with regard to field establishment of bush and climbing beans?
- Have you experienced any challenges?
- How have you tried to address them?

MAIZE BEAN INTERCROPPING SYSTEM



3.2 Intercropping and crop rotation

Beans can be grown either as a monocrop, or intercropped with other crops such as maize, cassava or sweet potatoes.

Although a bean monocrop is preferable for large scale production for efficient crop management and harvest, intercropping presents more benefits especially for small scale farmers:

› Higher production per land unit;
› Crop biodiversity contributes to natural pest regulation:
› Higher yield security. If one of the intercrops does not develop well, the farmer will get a harvest from the other crop.

Intercropping beans with other crops such as maize, bananas or tubers (yams, cassava, and sweet potatoes) is widely practiced and brings good results. Only 30 % of all beans in Africa are grown as monocrops, 50 % is intercropped with Maize, 10 % with Banana, 10 % with roots/tubers and 2 % with Sorghum. For example:

› Intercropping 2 to 3 maize plants with 6 bean plants per square meter can result in a 100 % yield for both crops.
› The yield of sweet potato intercropped with beans does not significantly differ from a monoculture of sweet potatoes. The recommended plant density is 3.3 sweet potatoes and 10 bean plants per square meter.
› Intercropping cassava with beans also gives excellent results, provided the cassava variety is not too vigorous and late branching. The yields reach 80 % for the cassava and 100 % for the beans.
› Intercropping bananas with beans has a positive effect on the banana yield and provides a 50 % bean yield compared to a monoculture of beans.

Beans used for intercropping are usually of determinate growth. Climbing beans can hinder or even suffocate the main crop. Towards the end of a maize growing season, climbing beans can be sown that use the dry maize stalks for support and use residual soil moisture.

Beans in a monocropping system must be grown in rotation with other crops. It is not advisable to grow beans for two consecutive seasons on the same field. Beans leave a nitrogen-rich soil allowing subsequent crops to therefore benefit and grow successfully. Examples of crop rotations with beans include root crops (cassava, sweet potatoes), cereals (maize, rice, sorghum) and vegetables (cabbage, tomatoes, onions).

Discussion on common practices of bean crop management

Invite the farmers to share their experiences:

› How do you set up bean fields?
› What field activities are performed after planting and how often?
› What else do you think needs to be done in order to encourage proper growth and good bean yields?

DIFFERENT TYPES OF TRELLIS

3.3 Plant support

Bush beans with determinate growth do not need any support material. Indeterminate bush beans may have to be supported with twigs or grown together with maize or cassava as support plants.

Climbing beans must be grown on some kind of trellis. The trellis should not be higher than 2 metres in order to make picking easier. When the beans reach the top of the trellis, the growing point of the main shoots should be pinched out. This reduces height and increases the growth of lateral shoots.

There are several ways to construct a trellis:

- **Single sticks -** They must be made of sturdy material since they are prone to falling or breaking in strong winds. Around each pole 6 to 8 seeds should be planted in a mould. After appearance, the weakest plants are removed and the strongest 5 are left.
- **Wigwam construction -** Three or four poles are tied together at the top forming a pyramid, which is more stable than a single pole. The poles are often made of mature elephant grass, tall reeds, bamboo or cassava stems. At the base, the poles are fixed in the soil 80 cm apart.
- **Tent construction -** Double rows of poles are tied together in pairs perpendicular to the seedbed. The pole pairs are interconnected at the top with a horizontal slat, thus forming a long tent. The feet of the pole pairs are 80 cm apart, the pole pairs 100 cm apart. The advantage of this construction is that less sturdy material such as reed can be used. The disadvantage of tent and wigwam constructions is the cumbersome harvest of beans hanging inside of the foliage, as well as the suboptimal exposure to sunlight and ventilation of the plants.
- **Single row trellis -** A sturdy pole is placed every 4 meters of the plant row. A metal wire is strung between the poles at a height of 2 metres. Strings are tied to the top wire and hang down as a support for the climbing beans. Alternatively, a wire or nylon net with a mesh width of 10 to 10 cm is hung from the top wire. This system offers ideal illumination and ventilation of the crop. The costs of the material, however, may prove prohibitive.
- **Live trellis -** Live materials such as maize or cassava are intercropped and used instead of sticks, poles or wires as support material for the beans. Maize stems from a previous maize harvest are left standing to support the climbing beans. Other materials such as cassava stems can be constructed either

as single sticks, single rows, wigwam or tent to support beans. The cassava develops roots so it becomes more stable. However, it needs regular pruning so that it does not overshadow the beans.

3.4 Improving soil fertility

Although beans can be grown on practically all soil types, deep, well drained sandy loams with a moderate pH are ideal. Unproductive soils can be improved by employing the following approaches. First is preventing soil organic matter loss. Second is incorporating organic material (e.g. green manures, compost or animal manure), which will increase organic matter and nutrient levels in the soil.

a. Soil conservation

Beans are delicate plants and susceptible to breakage by wind or running water from uphill, even in gently sloping areas. It is therefore highly advisable to grow beans (bush or climbing) as an intercrop within taller and stronger plants such as maize and cassava. In addition, proper terracing is needed to protect against soil and organic matter loss.

b. Addition of organic materials

Beans require modest amounts of nitrogen because of the symbiosis with Rhizobium bacteria that transform atmospheric nitrogen into nitrogen available to the plants. In poor soils, a small amount of nitrogen from a nitrogen rich source should be supplied before sowing to benefit the initial growing phase when the rhizobia are not yet active. Rhizobia develop better and faster in soil to which compost has been added.

Organic materials such as animal manure or compost should be applied to the land such that they are well incorporated into the soil during land preparation for planting. Animal manure or compost will make an important contribution to maintaining and increasing soil fertility. Soil fertility can also be increased by growing green manure crops and digging or ploughing them into the soil. Crop residues should be composted before application in order to benefit the beans. Fresh manure should be avoided because it attracts the bean fly. Therefore only composted manure should be applied to the bean fields. It is usually better to

Sharing information on local soil fertility management in bean production

Inquire among the farmers about their approach to soil fertility management in bean fields asking the following questions:

- Do you grow beans with any other crops together or in rotation?
- Do you apply any organic manure to the fields before or after planting?

Identify any shortcomings with the methods used and recommend appropriate modifications.

give a good supply of animal manure to the previous crop in the rotation, then the beans will not need any additional applications.

3.5 Proper weed control

Weeds contribute to biodiversity in the field, but compete with beans for water, nutrients and light. Weed control in bush beans is necessary until the bean foliage covers the rows, thereby inhibiting weed growth. Weeding is carried out with a hand or mechanical hoe. Along with hoeing, the rows should be ridged for better plant stability, protection of the plant collar and the formation of lateral roots. Ridging also covers weeds in the row. Weeds in the row that do not suffocate or that cannot be removed mechanically are pulled out by hand. During first hoeing, ridging is done when the bean plants are about 15 cm high.

Because climbing beans never completely cover the soil between the rows, weed control has to be carried out for a longer period than for bush beans, especially in the first half of the growing cycle. Weed growth in the second half of the growing cycle does not significantly influence the yield, but weeds should not be allowed to seed.

3.6 Proper pest and disease management

Beans suffer from a number of pests and diseases. The major insect pests in order of importance are aphids, cutworms, bean stem maggots (bean fly) and storage pests such as bruchids (bean weevil). The diseases in order of importance include bean mosaic viruses, blight, leaf rust, root rots, anthracnose and angular leaf spot. Organic management of pests and diseases in bean production is based on an integrated preventive package, which encourages that a range of practices are applied simultaneously to prevent the introduction and spread of pests and diseases. Individual management of specific pests and diseases is difficult in beans since they are very short term crops. The use of synthetic pesticides is not allowed in organic bean production.

Field visit to identify bean pests and diseases

If possible, visit different bean fields and identify any observable signs of pest or disease problems. Inquire about identification and knowledge on pests and diseases by asking the following questions:

- Are you familiar with the signs of pest and disease infections identified?
- Have you monitored to see when these pests and diseases are most likely to attack and the damage caused?

Pests and diseases can be effectively managed in the bean garden by using the following approaches:

- **Use of improved varieties -** Choose improved varieties with good yield potential and, if possible, resistant to common diseases or tolerant to major pests and adapted to local environmental conditions. Seeds should be obtained from approved seed suppliers or carefully selected to avoid introduction of seed-borne disease like viruses.
- **Proper field management -** Vigorously growing plants are more resilient and can tolerate pest and disease infections. Growing a healthy crop begins by choosing a suitable growing location that has loose, fertile soil, which helps quick emergence to avoid pests such as the bean fly. Fresh manure should not be applied in the bean garden in order to avoid the bean fly.
- **Early planting -** To avoid water stress and proper weeding early planting is recommended. Early planting will also enhance quick growth of the bean plants. Pests can be regulated by encouraging functional biodiversity. This is where natural enemies of pests are encouraged to develop and propagate unhindered. Beneficial insects will build up their population and prey on plant pests, for example the Syrphid fly (hover fly), a common predator of aphids, can prey also on the bean aphid. Since many beneficial insects depend on nectar and pollen of host plants, it is advisable to plant flowering plants along the boundaries or terraces within the garden.
- **Plant hygiene -** Another effective preventative measure is plant hygiene. Remove any plants with virus symptoms from the field and burn or bury them. Disease infested plant material should not be left in the field, but made into compost. The plot should then be rotated with other crops, meaning beans or other legumes should not be grown on the same plots for any 2 consecutive seasons.
- **Sulphur compounds -** Spray sulphur compounds at a 0.2 % concentration at the first signs of rust infection. Some varieties are susceptible to sulphur, make trial sprayings before treating the whole crop. On small plots, following regular scouting for pests, botanical plant extracts (such as *Tephrosia, Tithonia*, Marigold, Datura and Neem leaves) can be used to eliminate any evading pests.
- **Management of storage pests -** The most damaging storage pest reported by dry bean farmers is the bean bruchid (bean weevil) *Acanthoscelides obtectus*. Proper drying and clean storage is the best control for bean weevils or

HANDLING PROCESSES FOR GREEN DRY BEANS

HANDLING PROCESSES FOR DRY BEANS

bruchids. Botanical plant dried leaves (such as *Tephrosia, Tithonia,* Marigold, Datura) are also effective in controlling the bean weevil if mixed with the beans before storage.

4 Improving postharvest handling

In order to obtain good quality beans, minimize losses and avoid contamination risks from extraneous materials and agents, proper handling of beans is necessary. Depending on how the beans will be consumed (i.e. green, fresh or dried seeds), handling requirements will be different.

a. **Green beans -** They are harvested when the seeds are not fully developed. The beans should snap clearly when broken. The seeds of climbing beans are usually more developed than those of bush beans, but must still be soft and sweet.
The harvesting of bush beans begins after about 6 to 7 weeks, climbing beans 7 to 9 weeks after sowing. Bush beans are usually harvested 2 to 3 times with a 3 day interval. Climbing beans are harvested up to 6 times. Harvesting should be done early in the morning. The plants should be dry and in order to prevent moulding, the pods should not be washed.
The harvested pods of green beans must be put in a cool storage area at a temperature of 7 °C within a few hours after picking, if possible. Lower temperatures cause chilling damage. In the field the beans should be placed in the shade immediately after harvest and covered with a damp cloth. Green beans lose moisture, and hence weight, very quickly and turn floppy. Green beans mature very fast and require a good cooling system and ready markets to absorb the regular harvests.

b. **Dry beans** - These are harvested when the pods either turn yellow for fresh consumption or completely dry for storage purposes. The plants are uprooted and spread on the ground to dry or left to dry on the trellis. In some cases, the bean plants are tied up under shade/shelter to dry. Once the plants are dry the pods are threshed by hand or by slowly beating the pods in a sack to split them open without damaging the seeds. The seeds left in the sun to dry further are put on a raised platform or protected area to keep children and

Discussion on post-harvest handling of beans

Discuss potential for improvement of postharvest handling of beans by asking the farmers the following questions:

› Describe how you handle the bean crop from harvesting to drying and storage?
› Identify any shortcomings with the methods used and recommend appropriate modifications.

animals away. They are dried to a moisture content of less than 15 % (when the seeds are brittle when bitten). They should then be winnowed to remove all the chaff and sorted to remove broken beans, stones, deformed beans or any remaining plant parts. Broken and deformed beans can be prepared and eaten immediately because they do not store well. The beans should also be separated according to variety in order to increase their market value. Properly sorted beans attract a better price than unsorted beans.

Storage is done in clean cloth/sisal bags or sealed containers that should be checked occasionally to prevent infestation of bean weevils. Stored bean seed should be placed out in the sun occasionally (once every month) in order to reduce moisture content and to kill off pests. In some places, farmers mix the stored beans with maize or millet flour in order to keep pests away. This is mostly done for beans that are to be consumed by the farmer when the flour is washed off before cooking the beans. Bean seeds for next season's planting can be mixed with dried leaves of marigold, tephrosia, neem or any other locally tried plant, in order to keep storage pests away.

5 Marketing and organic certification of bean production

Organic certification commonly relates to marketing of organically grown products. Organic certification can, however, be costly, especially for generic products that have low market value like dry beans. Dry beans are primarily grown for the local market, while green beans have good domestic and export market potential. So it is thus rewarding only if the green beans can be marketed with an organic price premium over the regular price, which pays off the certification costs. However being an intensive crop, in order to produce enough volume, the farmers need to work together in a group. This is important in order to ensure the quality and quantity requirements.

General requirements for organic certification of bean production:

- Synthetic pesticides, herbicides and fertilizers as well as chemically treated or genetically modified seeds are not allowed.
- During postharvest handling and storage no chemicals are allowed.

Discussion on organic certification of bean production

Inquire about the appropriateness of organic certification by asking the farmers the following questions:

- Who are the main buyers of beans from the area?
- What are their requirements of quantity and quality?
- Are there any companies that require certified organic beans?

Specific national or international organic standards may define additional requirements for production and postharvest handling of beans. Farmers should therefore consult the national organic movement or organic certification body operating within the region or country.

Further reading:

- Information on organic bean pest and diseases and their control can be found under www.infonet-biovision.org
- For information on new high-yielding bean varieties check the website of the International Centre for Tropical Agriculture CIAT http://ciatnews.cgiar.org

Contact addresses of selected seed suppliers in Africa:

- African Seed Company: www.seedcogroup.com
- African Seed trade association: www.afsta.org
- Pannar Seeds South Africa: www.pannar.com
- East African Seed Company: www.easeed.com