



CODE OF GOOD AGRICULTURAL PRACTICE:

PLANTING OF DRY BEANS

**DRY BEANS - CODE OF GOOD PRACTICE -
PLANTING**

Price Group:

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STANDARDS ORGANISATION OF NIGERIA

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FOREWORD

Beans are major staple food crops in sub-Saharan Africa, especially in the dry savanna regions of West Africa. The seeds are a major source of plant proteins and vitamins for man, feed for animals, and also a source of cash income. The young leaves and immature pods are eaten as vegetables.

This Code of Good Agricultural Practice was elaborated by the technical committee on dry beans to provide guidelines in the production of good quality dry beans and ensure that the products are in a safe and hygienic environment. This takes into account some of the constraints encountered by farmers without compromising the quality, safety and suitability of dry beans for human and animal consumption.

In elaborating this code of practice, relevant information was obtained from National and International Standard bodies, Research Institutes and other stakeholders, all of whom are hereby acknowledged.

1. Scope

This Nigerian Code stipulates the minimum requirements for the cultivation of dry bean seeds to ensure production of quality dry bean seeds.

Move to the foreword. The objective of this Code of Good Agricultural Practice is to ensure that Dry Beans produced consistently meet requirements of food safety for human consumption.

This code excludes harvesting, processing, packing and storage of dry beans.

Normative reference

Insert the standard text

ARS 864 Dry beans- Specification

IITA- Farmers' Guide to Cowpea Production in West Africa

CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

2. Terminologies

For the purpose this standard, the following terminologies shall apply.

2.1 Essential element

Critical, main or key factor.

2.2 Crop producers

Entities involved in commercial production including individuals and companies.

2.3 Beans

Dry threshed field and garden beans, whole, broken and split, commonly used for edible purposes (ARS 864 Dry beans- Specification)

2.4 Fertigation

The injection of fertilizers, soil amendments, and other water-soluble products into an irrigation system

2.5 Economically viable production

Production that gives positive returns on a sustainable basis.

3.6 Environmentally sound

Practices that do not have adverse effect on the environment, i.e., air, soil and water.

3.7 Quality produce

Produce that is wholesome and safe for consumption and/or suitable for utilization.

3.8 Pests

Organisms capable of causing injury and loss to bean seeds including insects, other invertebrates, fungi, bacteria, viruses, weeds, vertebrates, *etc* .

3.9 Integrated pest management (IPM)

The management system that uses all suitable techniques and methods in a manner as compatible as possible to maintain pest population at levels below those causing economic injury.

3.10 Competent Agriculturist

Individual with formal training in agriculture and relevant expertise in the cultivation of beans.

3.11 Risk Management

A scientifically based process covering the following steps:

- (a) Hazard identification
- (b) Hazard characterization
- (c) Exposure assessment, and
- (d) Risk characterization.

4.0 Requirements

4.1 Traceability

In order to ensure that all produce is traceable to the farmer where it has been originally produced the farmer should record as a minimum:

- a) The source of the planting material
- b) The batch numbers or other unique identification code of the seed used
- c) The location of the farm;
- d) The date of planting
- e) Inputs (Pesticides and Fertilizers) used.

4.2 Record keeping

Farmers should keep up-to-date records. All records should be maintained and retained for at least 12 months unless stipulated by any specific legislation. An appropriate record keeping system should be established in which all the essential elements are captured. The records should be accessible, audited and treated as confidential.

4.3 Planting

4.3.4 All seed(s) variety should be sourced from certified suppliers. Records of planting materials, variety name, variety purity, batch number and seed vendor should be kept.

4.3.1 Choice of seed(s) variety should meet the required standards as agreed between crop producers and customers.

4.3.2 Genetically modified (GM) planting materials should not be used unless expressed permission has been given by the relevant authorities and should comply with existing regulations in the country of the final consumers.[National Biosafety Management Institute – find out who issues permission]

4.3.3 The planting of GM materials should be agreed between [appropriate regulators;] crop producers and customers before planting.

4.3.5 All clonal seeds should be sourced from reputable vendors with known historical yield performance of the parent materials.

4.3.6 Where protected varieties are used, the farmers should respect intellectual property rights legislation on plant variety protection.

4.3.7 Varieties of seeds used for planting should preferably possess resistance or tolerance to major pests and diseases so as to minimize utilization of pesticides.

4.3.8 If seed treatments are carried out, the use of these treatments should be justified and should be recorded.

4.4 Site history and site management

4.4.1 Site history

4.4.1.1 An appropriate recording should be established for the site history and layout of fields.

4.4.1.2 For all new bean seeds planting, a risk assessment should be carried out by a competent agriculturist, taking the following into account:

- (a) Prior use of the land;
- (b) Potential impacts of the production on adjacent crops and areas; and
- (c) Potential impact on activities carried out on adjacent areas.

The information on the risk assessment should be recorded

4.5 Climatic and Soil requirements

4.5.1 Climatic condition

4.5.1.1 Beans can be grown under rainfed conditions as well as by using irrigation or residual moisture along river or lake flood plains during the dry season, provided that the range of minimum and maximum temperatures is between 28 and 30°C (night and day) during the growing season.(IITA- Farmers' Guide to Cowpea Production in West Africa)

4.5.1.2 Beans perform well in agroecological zones where the rainfall range is between 500 and 1200 mm/year. However, with the development of extra-early and early maturing varieties, the crop can thrive in the Sahel where the rainfall is less than 500 mm/ year.

4.5.2 Soil Requirements

4.5.2.1 Beans are tolerant of drought and well adapted to sandy and poor soils. However, best yields are obtained in well-drained sandy loam to clay loam soils with the pH between 6 and 7.

4.5.2.2 Proper site selection is very important. Select a well-drained sandy loam soil for rainfed, or inland depressions and along the shores of a lake for dry season varieties using residual moisture. Beans does not tolerate excessively wet conditions or waterlogging and should not be grown on poorly drained soil

4.5.3 Preplanting

4.5.3.1 Land preparation

Clear the site of shrubs and stubble. Alternatively, spray the field with Glyphosate to kill emerged weeds. Land can also be prepared manually with the African hand-hoe. Plow and harrow the field to provide sufficient tilth for good root growth. Make ridges thereafter if desired. Where the soils are more fragile and prone to erosion, adopt minimum or zero tillage.

4.5.3.2 Seed requirement

Use about 25 -30 kg/ha of bean seeds, depending on the variety, seed size, cropping system, and viability of the seeds. More seeds are required when erect varieties are used than when prostrate varieties are adopted, because of the closer spacing of the erect variety. Also, fewer seeds are required when the bean seeds are to be grown in mixture with other crops. The larger the seeds, the more seeds/ha are required.

4.5.3.2 Seed preparation for planting

4.6 Planting

4.6.1 Time to plant

do not plant too early so that the crop does not mature during the rains, and also do not plant too late to avoid the danger of an early end to the rainsmaturity period of the beans variety

Be more specific as to provide relevant guidance:

Planting times will vary according to the variety planted and the rainfall patterns (meteorological patterns) of the region in which they are being planted.

4.6.2 Sowing and spacing

Erect bean varieties should be planted at a spacing of 50 cm between rows and 20 cm within rows, especially for extra-early maturing varieties (60–70 days). For semi-erect varieties, spacing should be 75 cm between rows and 25–30 cm within rows. For prostrate varieties, plant at a spacing of 75 cm between rows and 50 cm within rows. For all recommended plant spacings, sow 3 seeds/hill and thin to 2 plants/stand at 2 weeks after planting. Bean seeds should be planted either on ridges or on flat beds, depending upon the field preparation. Planting is usually manual, since mechanical planters are not readily available (IITA- Farmers' Guide to Cowpea Production in West Africa)

4.6.3 Sowing and spacing for intercropping

Where beans are to be intercropped or relayed with other crops, such as maize, the spacing should be 75 cm × 50 cm. Also the beans should be planted at about 4–6 weeks after planting the first crop, maize, sorghum, or millet. For strip intercropping, adopt 2 rows of cereal to 4 rows of bean seed to improve the productivity of erect and shade-sensitive bean varieties. The cereal and bean seed should be planted at the recommended spacing.

4.6.4 Sowing depth

Sow seeds at a depth of 2.5 to 5 cm for most varieties; planting seeds more than 5 cm deep will delay emergence. The seeds may rot and plant stand will be uneven.

4.6.5 Fertilizer rate and application

Bean plants do not require too much nitrogen fertilizer because they fix their own nitrogen from the air using the nodules in its roots.

SSP fertilizer required prior to planting at a rate of 100kg per ha in poor soils and NPK can be applied during the vegetative growth phase of the plants.

Other fertilizers can be used

4.7 Irrigation and fertigation

4.7.1 Planning

Crop producers are to base their irrigation or fertigation requirement on the recommendation of competent agriculturist.

4.7.2 Method

4.7.2.1 The most efficient and commercially practical water delivery system should be used to ensure the best utilization of nutrient and water resources as well as to protect water sources and avoidance of pollution.

4.7.2.2 Consideration should be given to a water management plan to optimize water and nutrient usage and reduce wastage (e.g. systems for re-use, application at night, maintenance of equipment to reduce leakage, collection of rain water, etc.).

4.7.2.3 Crop producers should maintain records of irrigation and fertigation water usage.

4.7.3 Quality of water

4.7.3.1 Untreated sewage water is prohibited for use.

4.7.3.2 Based on risk assessment, water sources should be analyzed at least once a year for microbial, chemical and mineral pollutants.

4.7.4 Supply of water

Water should be derived from sustainable sources. Farmers are encouraged to seek advice from relevant local authorities,.

4.8 Crop protection

4.8.1 Basic elements of crop protection

4.8.1.1 The use of pesticides to protect the crop should be done in accordance with manufacturer's specifications .

4.8.1.2 Wherever possible, crop producers should apply recognized Integrated Pest Management (IPM) techniques. Non-chemical control measures are preferred over chemical treatments.

4.8.1.3 Crop producers are encouraged to seek advice on IPM from competent agriculturists.

[Insert some of the techniques from](#)

4.8.2 Choice of agrochemicals

4.8.2.1 Appropriate agrochemicals should be utilized for crop protection purpose.

4.8.2.2 Crop producers should only use chemicals that are approved by appropriate authorities. E.g. National Agency for Food and Drugs Administration and Control (NAFDAC)

4.8.2.3 Instructions on the label shall be followed to ensure effective application and to avoid risks to operators, consumers and the environment.

4.8.2.4 An anti-resistance strategy (e.g. use of correct dosage and alternative chemicals) should be adopted to avoid reliance on any one chemical.

4.8.2.6 Crop producers shall not use chemicals that are banned or disallowed in importing countries.

4.8.2.7 Crop producers should consult their customers to determine if any additional commercial restrictions exist whenever necessary.

4.8.3 Advice on pesticide usage

Crop producers are encouraged to seek advice on pesticide usage from competent and relevant agriculturists or agronomists.

4.8.4 Records of application

All record of pesticide applications should include crop name, any intercrop and animal integration location, date and reason for application, trade name of pesticide used, dosage, method of application and name of operator.

4.8.5 Pre-harvest interval

Pre-harvest interval as prescribed on pesticides label should be adhered to.

4.8.6 Pesticide handling

Workers undertaking pesticides applications on farm should receive health checks regularly.

4.8.7 Hygiene

4.8.7.1 Where applicable, all product packing and storage sites should have adequate pest control measures, particularly in areas for food handling, storage of packaging, storage of pesticides and storage of fertilizers (CAC-1-1969, Rev 4-2003 Codex Alimentarius Commission/Recommended Code of Practice-General Principle Of Food Hygiene)

4.8.7.2 Where applicable, workers should receive basic training in hygiene requirements for the handling of fresh produce. The training program should conform to the relevant section of the regulation of food handling and hygiene regulations of NAFDAC.

4.9 Instruction and Supervision

Periodic assessments of the effectiveness of training and instruction programmes should be made, as well as routine supervision and checks to ensure that procedures are being carried out effectively.

Managers and supervisors of bean farm processes should have the necessary knowledge of food hygiene principles and practices to be able to judge potential risks and take the necessary action to remedy deficiencies.

4.10 Refresher Training

Training programmes should be routinely reviewed and updated where necessary. Systems should be in place to ensure that handlers remain aware of all procedures necessary to maintain the safety and suitability of dry bean seeds.

5.0 Application of HACCP System

HACCP system should be in place to enhance food safety, aid inspection by regulatory authorities and promote international trade by increasing confidence in food safety.

5.1 Records of complaints

Records of complaints on all produce not in compliance with requirements in this standard and their remedial actions should be made available on request.

5.2 Legal requirements

All farm activities and produce should in all other aspects comply with the requirements of the constitution of the Federal Republic of Nigeria.

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