

**CODE OF GOOD AGRICULTURAL PRACTICE:  
HARVESTING OF DRY BEANS  
DRY BEANS – CODE OF GOOD PRACTICE - HARVESTING**

**PRICE GROUP**

**© SON 2015**

**ICS**

**Approved by: SON Governing Council**

**Son**

**STANDARDS ORGANISATION OF NIGERIA**

**Operational Headquarters  
Plot 13/14 Victoria Arobieke Street  
Off Admiralty Way  
Lekki Peninsula Scheme 1  
Lekki, Lagos, Nigeria**

**Corporate Headquarters  
Plot 1687, Lome Street  
Wuse Zone 7  
Abuja, Nigeria**

---

**NO COPYING WITHOUT SON PERMISSION EXCEPT AS PERMITTED BY  
COPYRIGHT LAW**

### **FOREWORD**

Among the pulses, the dry beans is regarded as one of the most important field crops in sub-Saharan Africa due to its high protein content and dietary benefits to both Man, animals and plants.

This Code of Good Agricultural Practice was elaborated by the technical committee on Cereals, grains, legumes and their products to provide guidelines for minimizing seed damage & maximizing seed viability and vigor from pre-harvest through post-harvest processing.

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



**TECHNICAL COMMITTEE ON FOOD AND FOOD PRODUCTS**

**S/N                      NAMES                      ORGANISATION**

DRAFT

# CODE OF AGRICULTURAL PRACTICE FOR HARVESTING OF BEANS

## 1.0 Scope

This Nigerian Code of practice specifies all the processes involved in harvesting of bean seeds to assure yield of quality dry bean that is safe and suitable for consumption. It contains the guidelines necessary for harvesting beans from the pre-harvest stage through the post harvest stage. This code is recommended for farmers and all those involved in beans harvesting. This code excludes the processing, handling and transportation of beans.

## 2.0 Normative References

The following referenced materials are indispensable for the application of this code..... INCLUDE FULL TEXT FROM ;

1. (CAC/RCP 1-1969) Rev 3 (1997) - International Recommended code of Practice, General principles of Food Hygiene.
2. ARS-864- Dry Beans Specification

## 3.0 Terminologies

For the purpose of this code, the following terminologies from the general Principles of food Hygiene (CAC/RCP 1-1969) Rev 3 (1997) and dry beans specification CD-ARS 864 shall apply.

### 3.1 bean

Dry, threshed field & garden beans, whole, broken and split commonly used for edible purposes.

### 3.2 cleaning

The removal of soil, food residue, dirt, grease and other objectionable matter.

### 3.3 contaminant

Any biological or chemical agent, foreign matter, or other substances not intentionally added to the food which may compromise food safety or suitability.

### 3.4 damaged beans

beans and pieces of beans that are materially damaged or discoloured by frost, weather, disease, weevils or other insects, or other causes so as to materially affect the appearance and quality of the beans.

### 3.5 defective

Beans that have been damaged to some degree.

### 3.6 foreign matter

any extraneous matter than dry beans or other food grains comprising of (a) "inorganic matter" includes metallic pieces, shale, glass, dust, sand, gravel, stones, dirt, pebbles, lumps or earth, clay, mud and animal filth, etc; (b) "organic matter" consisting of detached seed coats, straws, weeds and other inedible grains, etc.

### 3.7 shrivelled beans

Beans which are under-developed and wrinkled over their entire surface excluding wrinkled beans

### **3.8 splits**

Pieces of beans that are not damaged, each of which consists of 75 % or less of the whole bean, and shall include any sound bean the halves of which are held together loosely.

### **3.9 primary production**

Those steps in the food chain up to and including, for example, harvesting, processing, handling.

## **4.0 Primary production**

### **4.1 Environmental hygiene in Harvesting Areas**

**4.1.1** Potential sources of contamination from the environment should be identified.

**4.1.2** Primary production should not be carried out when there are potentially harmful substances that may contaminate the beans during harvest.

**4.1.3** Contaminants, pests and diseases of animals and plants shall be controlled in such a way as not to pose a threat to food safety.

### **4.2 Water for primary production**

**4.2.1** Primary and secondary sources of water must be identified.

**4.2.2** The farmers should protect water sources against contamination and pollution, and use water prudently.

**4.2.3** Manure, fertilizers and agrochemicals must be handled and stored in a way that prevents contamination of water sources.

**4.2.4** Water should be assessed based on microbial and chemical safety, and suitability for intended use.

### **4.3 Personnel health, hygiene and sanitary facilities**

**4.3.1** An appropriate degree of personal hygiene should be maintained by all personnel

**4.3.2** Agricultural workers who come directly in contact with the beans during or after harvesting should comply with hygiene and health requirements so as not to contaminate the product.

### **4.4 Personnel hygiene and sanitary facilities**

**4.4.1** Hygienic and sanitary facilities should be available to ensure that an appropriate Degree of personal hygiene can be maintained.

**4.4.2** Sanitary facilities should be located in close proximity to the field but should not be close to water sources or in a place where rain can wash out contaminants or cause spills.

**4.4.3** They should be in sufficient number to accommodate all personnel and should be of appropriate design to ensure hygienic removal of wastes and avoid contamination of growing sites, the beans itself or agricultural inputs.

**4.4.4** Hand washing facilities should be provided and maintained in sanitary conditions.

#### **4.5 Health status**

**4.5.1** People who are suffering from or carriers of disease or illness or communicable diseases (i.e. hepatitis, tuberculosis) that may contaminate the beans should not be allowed in the beans growing or harvesting areas.

**4.5.2** Any affected person should immediately report illness or symptoms of illness.

#### **4.6 Equipment associated with growing and harvesting**

**4.6.1** Farmers should follow technical specifications on the use and maintenance of equipment.

**4.6.2** Equipment and containers coming in contact with the beans should be non-toxic and food-grade.

**4.6.3** They should be designed and constructed for easy cleaning and disinfection and maintained to avoid contamination of the beans.

**4.6.4** Containers for waste, by-products, and inedible or dangerous substances should be identified, suitably constructed and be made of impervious material where appropriate.

**4.6.5** Such containers should be secured to prevent accidental or malicious contamination of the beans or agricultural inputs, and segregated to prevent their use as harvesting containers.

**4.6.6** Containers no longer in hygienic condition should be discarded.

**4.6.7** Equipment and tools should function according to the use for which they are designed and should not damage the beans. Such equipment should be maintained in good condition.

#### **4.7 Cleaning programs**

**4.7.1** Cleaning and disinfection programs should be in place and carried out effectively and appropriately.

**4.7.2** Programs should be monitored for their effectiveness, reviewed and adapted to reflect changes in conditions.

**4.7.3** Production and harvesting equipment and reusable containers that come in contact with the beans should be cleaned and disinfected, as appropriate, on a regular basis.

#### **4.8 Pest control systems**

An integrated pest management program (IPM) must be in place to prevent or suppress Pest problems or apply controls that are safer for people and the environment

#### **4.9 Waste management**

**4.9.1** A suitable provision for storage and removal of waste should be made.

**4.9.2** Waste (particularly inorganic waste since organic wastes are used as natural fertilizers) should not be allowed to accumulate in the beans production area.

**4.9.3** Storage area for waste should be kept clean and dry.

#### **5.0 Record Keeping**

An effective record keeping method should be established to record all activities involved in the harvesting process including date at which pods were harvested. The records shall be accessible and traceable.

#### **6.0 Recommended Practices**

##### **6.1 Pre-Harvest**

**6.1.1** Use of green manures or nitrogen rich fertilizers should be avoided as too much nitrogen may cause excessive vegetative growth, promote diseases and slow down natural production in the root nodules.

**6.1.2** Weaker seedlings should be removed by cutting them off at soil level being careful not to disturb the roots of other seedlings.

**6.1.3** Handling of beans when wet should be avoided as this may generate spread of fungus spores.

**6.1.4** The planting area shall be kept clean and free of debris. Diseased plants should be removed.

##### **6.2 Determining Maturity**

**6.2.1** Pods begin to turn yellow during the final stages of growth, become brown and rather brittle once maturity is reached.

##### **6.3 Harvest**

**6.3.1** Depending on temperature and fresh market demands, beans are ready for harvest 16-17 days after bloom (60-90 days after planting).

**6.3.2** Harvesting should be done before the crop is too dry to avoid seed damage.

**Note:** Studies have shown that beans seed quality and germination decline rapidly when harvest is delayed.

## **6.4 Method of Harvesting**

**6.4.1** The harvesting process shall be determined by cultivar choice and the harvesting season may continue over a 3 week period.

**6.4.1** Dry beans can be harvested in three ways;

- The beans are pulled by hand and threshed using a tractor
- Partially mechanized system: the beans are pulled by hand and loaded into windrows where they are threshed with a stationary threshing machine.
- Fully automated system: the beans are pulled mechanically and raked in windrows and threshed by means of an automated combine.

**6.4.2** If the harvest is mechanized and combine is used, a low drum speed is required to avoid splitting and cracking of seeds and grains.

**6.4.3** Beans should be harvested when the moisture content of the pods are temporarily high (approx 30% to 40%) (to prevent shattering) i.e. early in the morning before the dew has evaporated.

Pods should be air-dried for a certain period of time before threshing to avoid molding and decay of the seeds.

## **6.5 Post- Harvest**

### **6.5.1 Threshing**

**6.5.2** Beans should be threshed to remove the seeds from the pod.

**6.5.3**

**6.4.4** The pods should be opened to remove the beans within a few days after harvesting.

**6.5.5** Care should be taken during threshing not to break or damage the beans.

**6.5.6** Threshing should be on a threshing rack to protect the beans from damage and dirt and prevent them from scattering.

## **6.6 Drying threshed beans**

**6.6.1** Threshed beans should be dried further to avoid molding during storage.

Drying is an important part of the harvesting process, the drying facilities should be planned for to ensure efficient drying and effective prevention of mold and loss or spoilage by pests.

Environmental impact of the drying process also needs to be taken into account.

Several options for drying are available and include:

- at a low temperature on Mechanical dryers
- on tarpaulins or plastic sheets
- segregated drying slabs
- wire mesh trays raised on a platform

**6.6.3** During the drying process, Beans should be turned intermittently to avoid overheating.

## **6.7 Sorting**

Dry beans should be sorted after threshing to separate defective, split, shriveled and damaged beans from the bulk before storage. Sorting can be done in two ways;

- i. By Handpicking or
- ii. By the use of treadle operated picking machines.

**6.8 Storage Conditions [refer to COP on handling and storage use the same requirements]**

## **6.9 Bean Treatment**

Ideal bean treatment should be

- i. Effective against seed borne pathogens
- ii. Relatively non- toxic to animals and human even if misused
- iii. Effective for a long period of time during seed storage
- iv. Easy to use
- v. Economical
- vi. Acceptable to the relevant regulating body.

## **BIBLIOGRAPHY**

1. Farmers Guide to Cowpea Production in West Africa.
2. Seed Processing and storage. Principles of seed harvesting, processing and storage. An organic seed production manual for seed growers in the mid-Atlantic and southern US.
3. Production guidelines for dry beans. Department of Agriculture, forestry and fisheries, Republic of South Africa.
4. Code of practice for the Prevention and Reduction of Ochratoxin A Contamination in Cocoa.