

Cowpea Technical Bulletin

Production and Storage



Technical Bulletin 5

Institute of Agricultural Research for Development (IRAD)
Maroua Research Center
CRSP Cowpea Storage Project

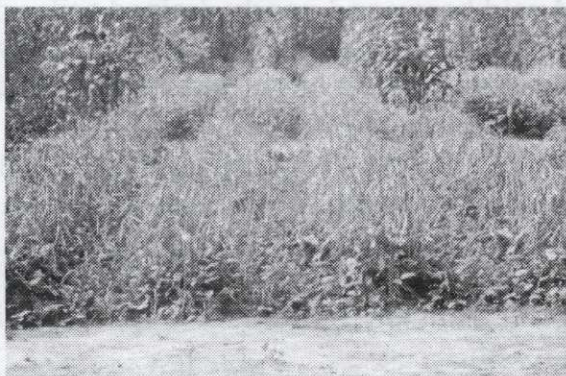
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1. Why Cowpea?

Cowpea (*Vigna unguiculata*) is an important food crop throughout Cameroon. Its grain and leaves are rich sources of high quality protein which complement the lower quality cereal or root and tuber protein. Cowpea is also important as fodder for livestock. It is important in natural resource conservation because it contributes to nutrient recycling and serves as an effective ground cover. It is becoming increasingly important as a cash crop, particularly with the release of new IRAD varieties with large white seeds which command a higher market premium.

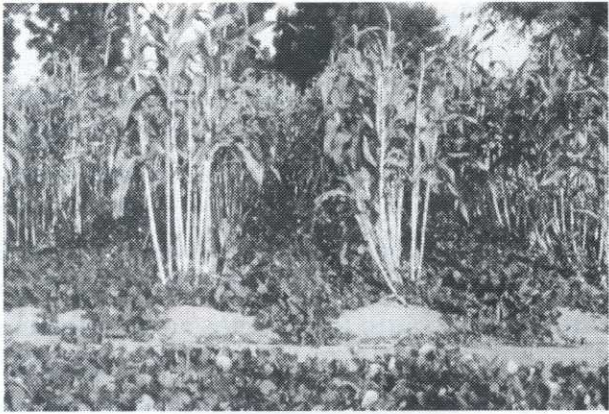
2. Characteristics

Cowpea is an annual herbaceous crop plant grown widely in drier areas (Sahelo-Sudanian Zones) of Africa. There is a great variety of cowpea forms and physiology. Cowpea growth cycles vary from less than 70 days to more than 120 days. The grain is characterized by its size (small, average and large), its color (white, brown, spotted, black, etc.) and its seed coat texture (smooth, rough).



Sole crop
cowpea (erect
plant type)

Cowpea inter-cropped with sorghum.



3. Cropping Pattern

You can plant cowpea either as a sole crop or in association with cereals or cotton. Plant sole-crop cowpeas preferably after cereals, or following a period of fallow. Whenever possible integrate cowpea in a cereals/legumes or a cotton/legumes system of rotation. Avoid planting cowpea in an area where cowpea was the previous crop.

4. Choice of Field

Avoid heavy and poorly drained soils with permanent or temporary flooding; these soils inhibit symbiotic nitrogen fixation. Select a fertile and adequately drained sandy-silt or sandy-clay soil.

5. Soil Preparation

Prepare the soil for planting with a plow or hoe, to obtain good plant emergence and to ensure optimum root growth.

6. Fertilization

Cowpea does not require nitrogen fertilizers. However, applying the following fertilizers will result in yield increases.

6.1 Phosphorus from 45 to 60 kg/ha of P205 or
19 to 25 kg/ha of P

6.2 Potassium from 30 to 35 kg/ha of K20 or
25 to 30 kg/ha of K

6.3 Nitrogen 20 kg/ha of N

6.4 Time of application. Broadcast the fertilizer and incorporate it into the soil immediately, before planting.

7. Planting

7.1 Date: In the Extreme North Province plant during the first half of July (July 5 to 15 is the best period). Late plantings can be done through 20 July without experiencing important yield losses.

In the North Province plant during the second half of July (July 15 to 25 is the best period). Delayed planting can also be done through 30 July.

Follow these planting periods as far as possible and plant after a good rain.

7.2 Density: Erect varieties (example: BRI)
80 cm x 25 cm
Spreading varieties (example: VYA)
80 cm x 50 cm

7.3 Method: 2-3 seeds per hill, thin to one plant per pocket 2 weeks after planting

Treat seeds with insecticide. Use 2 grams of Thioral per kg of seeds or any other appropriate insecticide before planting.

The amount of seed required to plant various land areas depends on the seed size and weight of the particular variety being planted. (See Section 13 for Seed Requirements Guidelines).

7.4 Depth of planting: 3 to 5 cm.

8. Maintenance

8.1 Weeding: The fields must be kept clean of weeds; hence, 2 weedings are needed: the first one should be done 10 to 15 days after planting, concurrently with thinning; the second weeding two weeks later.

8.2 Ridging: To ensure maximum production, construct tied ridges every 4 to 5 m concurrently with the second weeding.

9. Plant Protection: To effectively control all of the economically important cowpea insect species, the use of a combination of pyrethroids and organophosphorus insecticides is essential.

9.1 Products recommended for cowpea protection (See Table 9.1)

Note: the combination pyrethroids and Dimethoate are effective on almost all cowpea insects.

9.2 Application equipment: Solo sprayer, ULV sprayer, other appropriate equipment.

9.1 Products recommended for cowpea protection

Common names	Active material in insecticide	Formulation	Dosage	Quantity/Product for 1 ha	Product for 1 liter water
Decis 12.5 g/l Kothrine 2%	Deltamethrin	EC powder	12.5 g/l 25 to 50 g powder	1 liter	2 cc for 100 kg of grain
Cymbush 100 g/l	Cypermethin	EC	100 g	1 liter	P 2 cc
Karate 50 g/l	Lambda Cyhalothrine	EC	25 g	500 cc	1 cc
Systoate Rogor 400 g/l Rodion	Dimethoate	EC	400 g	1 liter	2 cc
Thiodan 350 g/l	Endosulfan	EC	525-700 g	1.5 to 2 l	3 cc
Thimul 12.5 + 400	Decis + Systoate	EC	12.5 - 400	1 l+1 l	2 cc+2 cc
Cymbush Super 100+400 Sherpa plus 15+150	Cypermethin + Dimethoate	EC EC	100=400	1 l+1 l 1 l+1 l	2 cc+2 cc 2 cc+ 2 cc
Karate Systoate 50+ 400	L. Cyhalothrine+ Dimethoate	EC	25=400	500ml+1 l	1 cc+2 cc

9.3 Number of applications

Two insecticide applications are required

- the first should be applied at the appearance of flowering buds 25 to 30 days after planting for the early maturing varieties, 35 to 40 days after planting for the late maturing varieties.
- the second should be applied 10 to 15 days after the first.

Note: proceed with treatment in case of an attack of leaf borers (example: *Ootheca mutabilis*), aphids or any other insects, whatever the stage of development of the plant.

10. Harvest

Harvest as soon as 90 to 95% of the pods are dry. It may be necessary to repeat the harvest 1 to 3 times, depending on the variety. The harvest date depends on the plant cycle. For medium cropping cycle varieties (example: BR1) harvest is done approximately 80 to 90 days after planting. For varieties with a long cropping cycle (example: VYA) harvest is done approximately 90 to 100 days after planting.

11. Drying and Threshing

If the crop matures after the seasonal rains have ended, pods are usually left to dry in the field on the plant. If additional drying is needed, pods are best dried on a pole structure known as a danki to avoid small animal or termite damage. Threshing may be done as soon as the pods are dry.

12. Storage

12.1 Preamble: The initial infestation of the cowpea crop by storage weevils takes place in the field before harvest, therefore it is important to disinfest the crop before storage. This is best accomplished by using the solar disinfestation method described in IRAD/CRSP Technical Bulletin #2.

12.2 Storage in ash: Cowpeas can also be stored mixed with ash, using earthenware storage jars. Mix one volume of ash per one volume of cowpea. (IRAD/CRSP Technical Bulletin #1).

12.3 Storage in triple plastic bags: Cowpeas can also be safely stored in triple plastic bags. Be sure to tightly close the ends of each bag to avoid air leaking into the bag; avoid using torn bags or those with holes. (IRAD/CRSP Technical Bulletin #3).

12.4 Storage in pod form on dankis: BR1 and new IRAD/CRSP developed varieties possess resistance to storage insects in their seeds and pods. These recommended varieties can be effectively stored during the dry season on dankis with very little insect damage (IRAD/CRSP Technical Bulletin #4).

12.5 Storage in airtight barrels. Grains can also be stored in airtight, tightly-sealed barrels. These barrels must be correctly cleaned and sealed. They must not have air leaks. Fill the barrel completely and close them to be airtight.

Seed Requirements (kg) for Seeding 1/4, 1/2, and 1 Hectare at Various Planting Densities with Seeds of Varying Weights

Seed weight (gms)/100 seeds	Number of Plants/ha and Number of Seeds/ha for Various Plant Spacings											
	(80 x 80cm) = 15625 plants/ha (3 seeds/hill = 46875 seeds/ha)			(80 x 50cm) = 25000 plants/ha (3 seeds/hill = 75000 seeds/ha)			(80 x 25cm) = 50000 plants/ha (3 seeds/hill = 150000 seeds/ha)			Seeds required (kgs)		
	1 ha	1/2 ha	1/4 ha	1 ha	1/2 ha	1/4 ha	1 ha	1/2 ha	1/4 ha	1 ha	1/2 ha	1/4 ha
12 gms	5.6 kg	2.8 kg	1.4 kg	9.0 kg	4.5 kg	2.3 kg	18.0 kg	9.0 kg	4.5 kg	18.0 kg	9.0 kg	4.5 kg
13 gms	6.1	3.1	1.6	9.75	4.9	2.4	19.5	9.8	4.9	19.5	9.8	4.9
14 gms	6.6	3.3	1.65	10.5	5.25	2.6	21.0	10.5	5.3	21.0	10.5	5.3
15 gms	7.1	3.6	1.8	11.25	5.6	2.8	22.5	11.3	5.6	22.5	11.3	5.6
16 gms	7.5	3.8	1.9	12.0	6.0	3.0	24.0	12.0	6.0	24.0	12.0	6.0
17 gms	8.0	4.0	2.0	12.75	6.4	3.2	25.5	12.8	6.4	25.5	12.8	6.4
18 gms	8.5	4.25	2.13	13.5	6.8	3.4	27.0	13.5	6.8	27.0	13.5	6.8
19 gms	8.9	4.5	2.2	14.25	7.1	3.6	28.5	14.3	7.1	28.5	14.3	7.1
20 gms	9.4	4.7	2.4	15.0	7.5	3.8	30.0	15.0	7.5	30.0	15.0	7.5