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EAST AFRICAN STANDARD

Cowpeas — Specification and grading

EAST AFRICAN COMMUNITY

HS 0713.39.15

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

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Introduction

In the preparation of this East African Standard, the following sources were consulted extensively:

KS 2124:2007, *Dry cowpeas — Specification*

Pulses Grading and Marking Rules, 2003, Schedule XIX, *Grade designation and definition of quality of Lobia*, Ministry of Agriculture, India, 7th April 2004

Malawi Standard, MBS 242:1991, *Cowpeas — Specification*

CODEX STAN 171:1989 (Rev. 1:1995), *Standard for Certain Pulses*

CODEX STAN 193:1995 (Rev.5:2009), *General Standard for Contaminants and Toxins in Foods*

CODEX STAN 228:2001 (Rev.1:2004), *General methods of analysis for contaminants*

Codex Alimentarius website: http://www.codexalimentarius.net/mrls/pestdes/jsp/pest_q-e.jsp

USDA Foreign Agricultural Service website: http://www.mrldatabase.com

USDA Agricultural Marketing Service website: http://www.ams.usda.gov/AMSv1.0/Standards

USDA Plant Inspectorate Service website: http://www.aphis.usda.gov/import_export/plants

European Union: http://ec.europa.eu/sanco_pesticides/public

Assistance derived from these sources and others inadvertently not mentioned is hereby acknowledged.

This standard has been developed to take into account:

— the needs of the market for the product;

— the need to facilitate fair domestic, regional and international trade and prevent technical barriers to trade by establishing a common trading language for buyers and sellers.

— the structure of the CODEX, UNECE, USA, ISO and other internationally significant standards;

— the needs of the producers in gaining knowledge of market standards, conformity assessment, commercial cultivars and crop production process;

— the need to transport the product in a manner that ensures keeping of quality until it reaches the consumer;

— the need for the plant protection authority to certify, through a simplified form, that the product is fit for cross-border and international trade without carrying plant disease vectors;

— the need to promote good agricultural practices that will enhance wider market access, involvement of small-scale traders and hence making farming a viable means of wealth creation; and

— the need to ensure a reliable production base of consistent and safe crops that meet customer requirements.

Contents

Cowpeas — Specification and grading

1 Scope

This East African Standard specifies the quality and grading requirements and methods of analysis for dry cowpeas of the varieties (cultivars) grown from *Vigna unguiculata* Linn.Sync. *Vigna sinensis* (L.) Hassk. intended for human consumption.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CAC/RCP 1, *Recommended international code of practice — General principles of food hygiene*

EAS 38, *Labelling of prepackaged foods — Specification*

EAS 79, *Cereals and pulses as grain — Methods of sampling*

EAS 217, *Methods for the microbiological examination of foods*

ISO 520, *Cereals and pulses — Determination of the mass of 1000 grains*

ISO 605, *Pulses — Determination of impurities, size, foreign odours, insects, and species and variety — Test methods*

ISO 2164, *Pulses — Determination of glycosidic hydrocyanic acid*

ISO 2171, *Cereals, pulses and by-products — Determination of ash yield by incineration*

ISO 4112, *Cereals and pulses — Guidance on measurement of the temperature of grain stored in bulk*

ISO 4174, *Cereals, oilseeds and pulses — Measurement of unit pressure loss in one-dimensional air flow through bulk grain*

ISO 5223, *Test sieves for cereals*

ISO 5526, *Cereals, pulses and other food grains — Nomenclature*

ISO 5527, *Cereals — Vocabulary*

ISO 6322-1, *Storage of cereals and pulses — Part 1: General recommendations for the keeping of cereals*

ISO 6322-2, *Storage of cereals and pulses — Part 2: Practical recommendations*

ISO 6322-3, *Storage of cereals and pulses — Part 3: Control of attack by pests*

ISO 6639-1, *Cereals and pulses — Determination of hidden insect infestation — Part 1: General principles*

ISO 6639-2, *Cereals and pulses — Determination of hidden insect infestation — Part 2: Sampling*

ISO 6639-3, *Cereals and pulses — Determination of hidden insect infestation — Part 3: Reference method*

ISO 6639-4, *Cereals and pulses — Determination of hidden insect infestation — Part 4: Rapid methods*

ISO 13690, *Cereals, pulses and milled products — Sampling of static batches*

ISO 16002, *Stored cereal grains and pulses — Guidance on the detection of infestation by live invertebrates by trapping*

ISO 16050, *Foodstuffs — Determination of aflatoxin B_1, and the total content of aflatoxin B_1, B_2, G_1 and G_2 in cereals, nuts and derived products — High performance liquid chromatographic method*

ISO/TS 16634-2, *Food products — Determination of the total nitrogen content by combustion according to the Dumas principle and calculation of the crude protein content — Part 2: Cereals, pulses and milled cereal products*

ISO 20483, *Cereals and pulses — Determination of the nitrogen content and calculation of the crude protein content — Kjeldahl method*

ISO 22000, *Food safety management systems — Requirements for any organization in the food chain*

ISO 24557, *Pulses — Determination of moisture content — Air-oven method*

OIML R87, *Quantity of product in prepackages*

3 Definitions and grading factors

For the purpose of this standard the following definitions and grading factors shall apply:

3.1
cowpeas
dry mature seeds of *Vigna unguiculata* L.

3.2
broken cowpeas
pieces of cowpeas that are less than three-quarters the size of a whole seed

3.3
cleaning for grade improvement
if the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time.

3.4
contaminated grain
grain containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations on food safety

3.5
dockage
any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality established for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain. Dockage in cowpeas includes

— material handpicked from the sieved sample, including all coarse foreign vegetable matter such as pods, stems, straw, and thistle tops

— all material removed by sieving

— soft earth pellets, if they are 10.0% or less of the uncleaned sample by weight

IMPORTANT! Do not handpick mineral matter, ergot, sclerotinia, or large-seeded grains other than chickpeas from the sieved sample.

3.7
net weight of sample
the sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of net weight.

3.8
kernel counts
— to do kernel counts you must have 500 grams of cleaned sample.
— all grading is done on representative portions divided down from the cleaned sample using a Boerner-type divider.

3.9
gross weight sample
the sample as it arrives is referred to as the uncleaned sample. Its weight is the gross weight of the sample

3.10
hazardous substances in samples
any pesticide, herbicide or desiccant

3.11
classes
there are several classes of cowpeas. The class forms part of the grade name.

3.12
colour
colour is assessed after the removal of damaged cowpeas and cowpeas assessed as green

If cowpeas are . . .	**Colour is . . .**
Sound, well matured and have a uniform normal colour	Good
Immature, but not green, have moderate amounts of adhered soil, are lightly stained but otherwise moderately discoloured from natural causes	Fair
Do not meet the definition of fair colour	Poor

3.13
damage
damaged cowpeas include whole or broken cowpeas that are sprouted, frost damaged, heated, damaged by insects, distinctly deteriorated or discoloured by weather or by disease, or that are otherwise

3.14
defective cowpeas
shall mean the following:

3.14.1
insect damaged
cowpeas which have been damaged by insects

3.14.2
discoloured cowpeas
cowpeas that have been discoloured by heat, fermentation, moulds, weathering soil or disease

3.14.3
diseased cowpeas
cowpeas which have been decayed by fungi, bacteria or other organisms of decay

3.14.4
germinated cowpeas
cowpeas which have sprouted

3.14.5
mouldy cowpeas
cowpeas with visible mycelial growth on their surface

3.14.6
shrivelled cowpeas
cowpeas which are under-developed and wrinkled over their entire surface excluding wrinkled chickpeas

3.14.7
heat damaged
cowpeas that have dull seed coats and discoloured cotyledons ranging from light tan to dark brown are considered heated. See *Damage.*

3.14.8
split
the cotyledons that have been separated

3.14.9
other coloured cowpeas
cowpeas, which are of different colour from the dominant variety

3.14.10
total defective cowpeas
total number of insect damaged and other defective grains

3.15
earth pellets
— hard earth pellets are pellets that do not crumble under light pressure. See *Stones.*
— soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets.*

3.16
ergot
sclerotia (sclerotium, in singular) of the fungus, *Claviceps* species, which are associated with some seeds where the fungal organism has replaced the seed. A plant disease producing elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

3.17
fertilizer pellets
fertilizer pellets are typically either small, round and white or irregular shaped and pink or red. Fertilizer pellets are not considered a hazardous substance however there is no visible means of assuring that material resembling fertilizer pellets is not some other contaminant.

3.18
fireburnt
samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds crumble easily under pressure. No fireburnt seeds are allowed in cowpeas.

3.19
foreign matter
foreign matter in cowpeas material includes
— other classes of cowpeas
— other grains and seeds
— ergot and sclerotinia
— mineral matter, stones and earth pellets
— excreta
— any other material not removed by normal cleaning procedures

3.20
insect parts
pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances. If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an

objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions.

3.21
mechanical damage including splits
in cowpeas, mechanical damage including splits includes
— whole cowpeas with more than 10% of the cowpea broken off
— split cowpeas

IMPORTANT! Seeds with hairline cracks and chipped seed coats are not considered mechanical damage.

3.22
odour
there is no numeric tolerance for odour. Consider
— the basic quality of the sample
— the type and degree of the odour
— the presence of visible residue causing the odour

3.23
poisonous, toxic and/or harmful seeds
any seed which if present in quantities above permissible limit may have damaging or dangerous effect on health, organoleptic properties or technological performance such as Jimson weed — dhatura (*D. fastuosa* Linn and *D. stramonium* Linn.) corn cokle (*Agrostemma githago* L., *Machai Lallium remulenum* Linn.) Akra (Vicia species), *Argemone mexicana*, Khesari and other seeds that are commonly recognized as harmful to health

3.24
rotted
see *heated*

3.25
Sclerotia (sclerotium, singular)
dark colored or black resting bodies of the fungi *Sclerotinia* and *Claviceps*

3.26
Sclerotinia
genus name which includes the fungus *Sclerotinia sclerotiorum* which produces sclerotia. *Sclerotinia sclerotiorum* is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

3.27
soft earth pellets
soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be
— earth and fertilizer pellets
— any non-toxic material of similar consistency

3.28
splits
— halves or smaller pieces of cowpeas
— halves that are loosely held together by cracked seed coats
— cowpeas with cracked cotyledons, such as from artificial drying
Splits do not include cowpeas that are otherwise damaged.

3.29
sprouted
cowpeas in which the hull is parted over the area of the germ as a result of sprouting are considered damaged. See *Damage.*

3.30
stones
hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight.

3.31
treated seed and other chemical substances
(a) Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

(b) Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

3.32
varieties
cowpeas are graded with reference to varieties

4 Requirements

4.1 General requirements

4.1.1 Cowpeas shall meet the following general requirements/limits as determined using the relevant standards listed in Clause 2. Cowpeas

a) shall be the dried mature grains of *Vigna unguiculata* Linn;

b) shall be sweet, well-filled, clean, wholesome, uniform in size, shape, colour and in sound merchantable conditions;

c) shall be free from substances which render them unfit for human or animal consumption or processing into or utilisation thereof as food or feed;

d) shall be free of pests, live animals, animal carcasses, animal droppings, fungus infestation, added colouring matter, moulds and must meet any other phytosanitary requirements specified by the importing country authority;

e) shall be free from filth (impurities of plant and animal origin including insects, rodent hair and excreta) in amounts that represent a hazard to human health;

f) shall be free from toxic or noxious seeds that are commonly recognized as harmful to health;

g) shall be free from abnormal flavours, musty, sour or other undesirable odour, obnoxious smell and discolouration;

h) shall be free from micro-organisms and substances originating from micro-organisms, fungi or other poisonous or deleterious substances in amounts that may constitute a hazard to human health.

i) shall be free from glass, metal, coal or dung;

j) shall contain no chemical residues which exceed the prescribed maximum residue limit: Provided that:

(i) if the prescribed maximum residue limit of an importing country is lower than is permissible, the prescribed maximum residue limit of the importing country shall be complied with; and

(ii) the Food Safety Authority may grant permission for cowpeas with a higher maximum residue limit, to be exported to countries where this higher residue limit is permissible: Provided that the export documents are accordingly endorsed with the name of the importing country;

k) shall contain not more than 10 microgram per kilogram aflatoxin of which not more than 5 microgram per kilogram may be aflatoxin B1: Provided that:

(i) if the prescribed maximum aflatoxin limit of an importing country is lower than is permissible, the prescribed maximum aflatoxin limit of the importing country shall be complied with;

(ii) the Food Safety Authority may grant permission for cowpeas with a higher maximum aflatoxin content to be exported to countries where this higher aflatoxin limit is permissible: Provided that the export documents are accordingly endorsed with the name of the importing country; and

(iii) an inspector shall verify compliance to the levels of aflatoxin by sampling and submitting samples for analysis of only certain consignments according to a risk-based plan.

l) shall comply with the requirements for declared plant injurious organisms of phytosanitary importance as determined by the plant health protection agency.

4.1.2 Cowpeas shall have even cooking properties.

4.1.3 If cowpeas are presented in bags, the bags shall also be free of pests and contaminants. In addition the cowpeas shall comply with any conditions set by the importing country authority.

4.1.4 If cowpeas are rejected because pests or contaminants are found in inspected samples, the cowpeas are not to be re-presented for inspection unless they have been treated or cleaned.

4.1.5 Blending of rejected cowpeas is not permitted as a treatment for insect infestation or as a method of cleaning for contaminants for which there is a nil tolerance

4.1.6 Brushing the outside of bags is not permitted as a remedy to remove pests or contaminants.

4.2 Classification

Cowpeas shall be classified into three grades on the basis of the tolerable limits established in Table 1 which shall be additional to the general requirements set out in this standard.

4.3 Unclassified cowpeas

Shall be cowpeas which do not fall within the requirements of Grades 1, 2 and 3 of this standard but are not rejected cowpeas.

4.4 Reject grade cowpeas

This comprises dry cowpeas, which have objectionable odour, off flavour, living insects or which do not possess the quality characteristics specified in Table 1. They cannot satisfy the conditions of under grade cowpeas and shall be classified as reject cowpeas and shall be regarded as unfit for human consumption.

Table 1 — Specific requirements for cowpeas

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Parameter		Requirements			Method of test
		Grade 1	Grade 2	Grade 3	
Physical characteristics	The cowpeas (*Vigna unguiculata* (L.) Walp. ssp. *unguiculata;* Syn: *Vigna sinensis* (L.) Savi ex Hassk.) shall have a good bright appearance of the specified type i.e. buff coloured or red. Shall be sweet, clean, wholesome, uniform in size, shape, colour and in sound merchantable conditions				ISO 605
Purity, % min by wt Whole cowpeas, defective cowpeas, cowpeas other than specified type		99.0	97.0	97.0	
Moisture, % max by wt		10.0	12.0	14.0	ISO 24557
Damage, % by mass, *max, unless otherwise stated*	Heated or rotted	Nil	3K	1.0	
	Mouldy	Nil	6K	2.0	
	Mechanical damage including splits	1.0	2.0	3.0	
	Weevilled grains, % by count	2.0	3.0	6.0	
	Immature seeds	1.0	2.0	3.0	
Defective, % max by wt Cowpeas not of the specified variety. Cowpeas that are bin burnt, broken, caked, chipped, frost damaged, heat damaged, insect damaged, shrivelled, split, sprouted, weather damaged, wrinkled and affected by mould (field or storage). Includes pods that contain cowpeas, whether broken or unbroken and loose seed coat.		2.0% Max by weight	4.0% Max by weight	5.0% Max by weight	ISO 605
Poor colour Seed coat or kernel which is distinctly off colour from the characteristic colour of the predominating class of the specified type. Includes Ascochyta affected lesions.		1 % Max by weight	1 % Max by weight	3% Max by weight	
Foreign matter, % by mass, *max.*	Excreta	0.01	0.01	0.01	
	Ergot	Nil	0.05	0.05	
	Insect parts	0.02	0.02	0.02	ISO 605
	Sclerotinia	0.05	0.05	0.05	
	Stones or shale	0.10	0.20	0.50	
Foreign material (Total) Unmillable material and all vegetable matter other than cowpea seed material.		0.20% max by weight, includes 0.1% max by weight unmillable material	0.6% max by wt, includes 0.5% max by wt unmillable material	1.0% max by wt, includes 0.75% max by wt unmillable material	
Contrasting classes Beans with more than 2.0% contrasting classes are graded as mixed beans		0.5 % Max by weight	1.0 % Max by weight	2.0 % Max by weight	
Classes that blend Beans with more than 15.0 % classes that blend are graded as mixed beans		5.0 % Max by weight	10.0 % Max by weight	15.0 % Max by weight	
In addition to classes that blend, white beans similar in size and shape in the class yellow eye beans		5.0 % Max by weight	5.0 % Max by weight	—	
Other edible grains, % Max by weight Any edible grains (including oil seeds) other than the one which is under consideration		Nil	2.0	6.0	
Unmillable material Soil, stones, metals and non-vegetable matter.		0.1% Max by weight (of which nil % soil)	0.5% Max by weight (of which Max 0.2% soil)	0.75% Max by weight (of which Max 0.25% soil)	EAS 46; 4.3.3
Snails Dead or alive. Whole or substantially whole (more than half) including bodies per 200g sample.		Nil tolerance	Nil tolerance	Nil tolerance	
Field insects, Dead per 200g sample.		Two (2) Max	Thirty (30) Max	Thirty (30) Max	EAS 46
Foreign seeds		—	—	—	EAS 46
Objectionable material Includes objectionable odour, flavour/taste		Nil tolerance	Nil tolerance	Nil tolerance	EAS 46
Ryegrass ergot Pieces laid end to end per 200g sample.		Two (2) cms Max	Two (2) cms Max	Two (2) cms Max	
Uric acid, Maximum per kg sample		100 ml	100 ml	100 ml	
Aflatoxin – Total ppb (Total Aflatoxin including (AFB1+AFB2+AFG1 +AFG2))		10	10	10	ISO 16050
Fumonisin – Total ppb (Total Fumonisin including (FB1 + FB2 + FB3))		5	5	5	ISO 16050
K Number of kernel sized pieces in 500 g.					

5 Contaminants

5.1 Toxic metals

Cowpeas shall be free from heavy metals in amounts which may represent a hazard to health. If present, they shall not exceed the limits established in Table 2.

Table 2 — Toxic metal contaminant limits

Parameter		Limit	Test method
i)	Arsenic (As), ppm max.	0.10	EAS 41
ii)	Copper (Cu), ppm max.	5.0	
iii)	Lead (Pb), ppm max.	0.10	
iv)	Cadmium (Cd), ppm max.	0.02	
v)	Mercury (Hg), ppm max.	0.01	

5.2 Pesticide residues

Cowpeas shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity. The table below provides current MRLs while Annex E provides current MRLs for the USA, EU and Codex markets.

Maximum pesticide residue limits and extraneous maximum residue limits in cowpeas (current as at 2009-06-09)

Type	Unit symbol	Limit	Method of test	Notes
DIQUAT	mg/kg	0.2		
FLUDIOXONIL	undef	0.07		
GLUFOSINATE-AMMONIUM	mg/kg	3		
GLYPHOSATE	undef	5		
METHIDATHION	mg/kg	0.1		
METHIOCARB	mg/kg	0.1		
PARATHION-METHYL	mg/kg	0.3		
PYRACLOSTROBIN	undef	0.3		
QUINTOZENE	mg/kg	0.01		

5.3 Mycotoxin and chemical limits

Cowpeas shall comply with those maximum mycotoxin limits established by the Codex Alimentarius Commission for this commodity.

5.3.1 Uric acid shall not exceed 100 milligrams per kilogram.

5.3.2 Total aflatoxin levels in beans for human consumption shall not exceed 10 ppb with B_1 not exceeding 5 ppb when tested according to ISO 16050.

5.4 Environment

Cowpeas shall be produced, processed and handled under conditions complying with the stipulations of relevant environmental regulations and therefore conform to cleaner production technological practices.

6 Hygiene

6.1 It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of CAC/RCP 1, ISO 22000, and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

6.2 The produce should comply with any microbiological criteria established in accordance with CAC/GL 21.

6.3 To the extent possible in good manufacturing practice, the products shall be free from objectionable mater.

6.4 When tested by appropriate standards of sampling and examination listed in Clause 2, the products:

— shall be free from microorganisms in amounts which may represent a hazard to health and shall not exceed the limits stipulated in Table 3;

— shall be free from parasites which may represent a hazard to health; and

— shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

Table 3 — Microbiological limits for cowpeas

	Type of micro-organism	Limits	Test method
i)	Yeasts and moulds, max. per g	10^2	EAS 217
ii)	*S.aureus* per 25 g	Nil	
iii)	*E. Coli*, max. per g	Nil	
iv)	*Salmonella,* max. per 25 g	Nil	

7 Packaging

7.1 Cowpeas shall be packed in gunny bags/jute bags, poly woven bags, poly pouches, cloth bags or other suitable packages which shall be clean, sound, free from insect, fungal infestation and the packing material shall be of food grade quality.

7.2 Cowpeas shall be packed in containers which will safeguard the hygienic, nutritional, technological and organoleptic qualities of the products.

7.3 The containers, including packaging material, shall be made of substances which are safe and suitable for their intended use. They shall not impart any toxic substance or undesirable odour or flavour to the product.

7.4 The net weight of the cowpeas in a package shall comply with OIML R87.

7.5 Each package shall contain cowpeas of the same type and of the same grade designation.

7.6 Each package shall be securely closed and sealed.

8 Marking or labelling

8.1 In addition to the requirements in EAS 38, each package shall be legibly and indelibly marked with the following:

i) product name as “Dry Cowpeas”;

ii) variety;

iii) grade;

iv) name, address and physical location of the manufacturer/ packer/importer;

v) lot/batch/code number;

vi) net weight, in g/kg;

vii) the declaration “Food for Human Consumption’’;

viii) storage instruction as “Store in a cool dry place away from any contaminants’’;

ix) crop year;

x) packing date;

xi) expiry date or best before _____month _____ year;

xii) a declaration of the product lifespan;

xiii) instructions on disposal of used package;

xiv) country of origin;

xv) a declaration on whether the dry cowpeas were genetically modified or not.

8.2 A declaration of any inaccurate information in marking/labelling is prohibited and shall be punishable by law under the statutes of the Partner States.

8.3 The authorized packer shall observe all instructions regarding testing, grading, packing, marking, sealing and maintenance of records applicable to the product.

9 Sampling

Sampling shall be done in accordance with the EAS 79/ISO 13690.

Cowpeas Green, white speckled, brown

Cowpeas: Black eyed; red

Black eyed cowpeas

Sprouted brown cowpeas

Cowpeas in farm: pods and foliage

Annex A
(normative)

Determination of uric acid

A.1 Principle

The method is based on the precipitation of proteins and treatment of protein free filterate with uric acid and sodium cyanide and measuring the resultant blue colour colorimetrically.

A.2 Apparatus

(a) **Photo electric colorimeter/spectrophotometer**

(b) **Volumetric flask** — 50 ml capacity

A.3 Reagents

(a) **Sodium Tungstate solution** — 10 % (w/ v)

(b) **Standard Sulphuric Acid solution** — 0.667 N

(c) **Benedicts Uric acid reagent** — Dissolve 100 gm of pure Sodium Tungstate in 600 ml water. Add 5 gm of Arsenic acid (As_2O_3) followed by 25 ml of 85% phosphoric acid and 20 ml of conc HCl. Boil the mixture for 20 minutes, cool and make volume upto 1 litre.

(d) **Sodium Cyanide solution** — 5 percent containing 2 ml of ammonia per litre. This solution requires to be prepared fresh after about six weeks.

(e) **Standard Uric acid solution (Benedicts) stock solution** — Dissolve 9 gm of Sodium dihydrogen phosphate in about 200 – 300 ml water. If the solution is not clear, filter and make upto 500 ml with hot water. Weigh 200 mg of pure uric acid in 1 litre volumetric flask and add a few mls of water to suspend the uric acid. Now add the solution made earlier and shake till the uric acid dissolves completely. Cool, add 1.4 ml of glacial acetic acid, dilute to mark and mix. Add 5 ml chloroform to prevent bacterial growth. 5 ml of stock solution contains 1 mg uric acid.

(f) **Working Standard uric acid solution** — Dilute 50 ml of stock solution containing 10 mg of uric acid with 400 ml distilled water in a 500 ml volumetric flask. Add 25 ml dilute HCl (1+ 9). Make the solution upto mark and mix. The working solution should be prepared from stock solution which is more than 10 days old.

A.4 Procedure

Weigh 50 gm sample and grind it finely. Take between 4 - 20 gm powder expected to contain 1 mg to 5 mg uric acid and suspend in 200 ml water. Allow the mixture to stand for 2 hours and then mix in a Waring blender for 10 minutes and centrifuge at about 2000 r.p.m for 10 minutes. To 100 ml of clear centrifugate add 10 ml Sodium tungstate solution and mix. Then add 10 ml standard sulphuric acid solution to precipitate the proteins present in the extract.

Mix and allow to stand for 5 minutes and filter. Take an aliquot of the filterate containing between 0.15-0.3 mg uric acid per 10 ml filterate in the 50 ml volumetric flask and add 5 ml of sodium cyanide solution followed by1 ml of Benedicts uric acid reagent. Shake gently and make upto mark with distilled water.

Take 10 ml of standard uric acid solution containing 0.2 mg of uric acid in a 50 ml flask, add 5 ml of sodium cyanide followed by 1 ml of Benedicts uric acid reagent. Dilute to mark after 5 minutes and determine the intensity of colour in a photoelectric colorimeter using a 520 nm filter.

A parallel test using the same quantity of good uninfested sample as the sample under test should be run as a control.

Annex B
(normative)

Test for presence of ergot in food grains

B.1 Reagents

(a) **Petroleum ether** — 40 – 60 0 C

(b) **Solvent ether**

(c) **Dilute Ammonia** 10 % (v/ v)

(d) **Tartaric acid solution** — 1 % (freshly prepared)

(e) **p-dimethyl amino benzaldehyde (PDAB)** — Dissolve 0.125 gm of PDAB in a cold mixture of 65 ml of conc Sulphuric acid and 35 ml of distilled water.

Add 0.1 ml of 5 % Ferric chloride solution and let it stand for 24 hours before use.

B.2 Apparatus

(a) Grinding mill

(b) Electric shaker

B.3 Procedure

Grind about 50 gm of sample in the grinding mill to a fine powder. Take 10 gm of powdered sample in a stoppered conical flask. Add sufficient petroleum ether and shake for half an hour in the electric shaker. Allow to settle and decant off the petroleum ether. Dry the material in air. Add to the material 8 ml of dilute ammonia and sufficient quantity of solvent ether. Again shake for ½ hour. Filter ether portion in a beaker and concentrate to a small volume. Add 2 ml of tartaric acid solution to the beaker and shake thoroughly. Mix 1 ml of this tartaric acid – sample solution with 1 or 2 ml of p-dimethyl benzaldehyde solution.

The appearance of blue colour indicates presence of Ergot.

Annex C
(informative)

Model certificate of conformity with standards for farm produce

1. Trader:	Certificate of conformity with the Community marketing standards applicable to fresh fruits and vegetables No. …….. (This certificate is exclusively for the use of inspection bodies)	
2. Packer identified on packaging (if other than trader)	3. Inspection body	
	4. Place of inspection/country of origin ([1])	5. Region or country of destination
6. Identifier of means of transport	7. ☐ Internal ☐ Import ☐ Export	
8. Packages (number and type)	9. Type of product (variety if the standards specifies)	10. Quality Class / 11. Total net weight in kg

12. The consignment referred to above conforms, at the time of issue, with the Community standards in force, vide:

CD/K/453:2010, *Cowpeas — Specification and grading*

Customs office foreseen: …… Place and date of issue ……

Valid until (date): ……

Signatory (name in block letters): ……..

Signature Seal of competent authority

13. Observations:

([1]) Where the goods are being re-exported, indicate the origin in box 9.

Annex D
(normative)

Cowpeas — Fact sheet

A versatile legume for hot, dry conditions

D.1 *Vigna unguiculata*

Authority	(L.) Walp.
Family	Magnoliopsida:Rosidae:Fabales:Leguminosae
Synonyms	*Dolichos biflorus* L., *Dolichos catjang* L., *Dolichos melanophtalmos* DC., *Dolichos sinensis* L., *Dolichos unguiculata* L., *Dolichos unguiculatus* L., *Vigna sesquipedalis* (L.) Fruw, *Vigna catjang* (Burm. f.) Walp., *Vigna catjiang* (Burm. f.) Walp. var. *sinensis* (L.), *Vigna unguiculata* var. *catjang* Bertoni, *Vigna unguiculata* ssp. *sesquipedalis* (L.) Verdc., *Vigna sinensis* (L.) Hassk., *Vigna sinensis* ssp. *sinensis* (L.) Hassk.
Common names	Southern pea (USA), yard long bean, pois inconnu, pois manger cochon, frijol de vaca, jiangdou, caupí, boeme, catjang, niebe, pois liane, Cowpea, crowder pea, clack-eyed pea, atimbawini, boontjie, catjang, caupí, frijol de vaca, imbumba, isihlumaya.
Editor	
Ecocrop code	2153

Description

It is a herbaceous, prostrate, climbing, or sub-erect to erect legume, growing 15-80 cm high. Erect and bushy to prostrate and creeping growth habits exist depending on cultivar and growing conditions. Cowpeas develop strong root systems that have many spreading laterals in the surface soil. The stems have circular sections and are pock marked. They are sometimes slightly grooved and are glabrous. The texture is fibrous and hard, firm and not inflated when young. Leaves are alternate and trifoliolate and the leaflets are oval, pointed (6-15 cm x 4-11 cm). They are generally entire and sometimes lobed. Genotypes vary in the degree of pubescence, but all cultivated cowpeas are less glabrous than other legumes such as common bean and soybean. Stipules are spurred at the base, stipels are hardly visible. Inflorescence racemose, flowers white, cream, yellow, mauve or purple. Pods usually occur in pairs forming a V, and are non-dehiscent. Pod orientation is mostly pendant and vertical. Pod length ranges from 6.5-25 cm and the width ranges from 3-12 mm. Under warm conditions, pod development is rapid and may take only two weeks from pollination to pod maturation. Each pod holds from 8 to 20 seeds in a crowded orientation. Seed length is between 6-11 mm and the width is from 4-9 mm. The testa colour also varies from white, pinky-white, pink, tan, brown, and black. The hylum is often ringed black or brown, strongly contrasting with the shade of the testa and hence the name "blackeyed beans" of the Antilles. The testa is thick and of ellipsoid and more or less rounded form. Number of seeds per kg is from 4600 up to 16000.

Uses

Cowpea is one of the most important grain legumes in Africa and in parts of the Americas and Asia. In addition to its dry grain, fresh-shelled 'peas', fresh pods, and fresh and dried leaves and flowers are consumed in some regions. The plant is used as cut and carry forage, and for hay and silage. Cowpea forms highly effective associations with a wide range of native nitrogen fixing strains of Rhizobium bacteria and with mycorrhizae that allows the species to tolerate poor soils. Used as a

green manure, it can be incorporated into the soil 8-10 weeks after sowing, and can provide the equivalent of 80 kg/ha N to a subsequent crop.

Killing temperature: It is susceptible to frost.

Growing period

Annual. Some cowpea accessions may start flowering 30 days after sowing and are ready for harvest of dry seeds 25 days later; others may take more than 90 days to flower, and 210-240 days to mature.

Further information

It is native of West Africa and cultivated throughout the tropics and subtropics between 40ºN and 30ºS at elevations between sea level and 2000 m. Occurs in areas with annual rainfall between 400-2000 mm and summer temperatures between 25-35°C. Found on a wide range of very acid (pH 4) to strongly alkaline also low-fertility soils from sands to heavy, well-drained clays, with a preference for lighter soils. It does not tolerate extended flooding or salinity. Most cowpea accessions exhibit classic short-day responses with respect to time of flowering, although a range of sensitivities occur and the effect is modulated by temperature. It is mainly autogamous and in most environments outcrossing is low (less than 5%), but in the presence of bumble bees or other large insects, out-crossing can be much higher. Flowers open early in the morning, close by noon and may fall off during the same day. The photoperiodism of many African landraces confers adaptation to a specific latitude and rainfall pattern such that flowering and pod development coincide with the end of the rainy season in a particular place ensuring that pods mature in dry weather thus avoiding pod rots and other diseases. The photosynthetic pathway is C3 and the leaves have full maximal rates of photosynthesis at full expansion. Vegetative DM production 3-10 t/ha in 8-12 weeks; grain production 250-4000 kg/ha.

D.2 *Vigna unguiculata* ssp. *biflora*

Authority	(L.) Verdc.
Family	Magnoliopsida:Rosidae:Fabales:Leguminosae
Synonyms	*V. cylindrica*, *V. catjang*, *V. unguiculata* ssp. *cylindrica*, *Dolichos biflorus*, *D. catjang*, *Phaseolus cylindricus*.
Common names	Sowpea, Catjang, Hindu, Jerusalem pea, Marble pea, Catjan, Cowpea, Dolique, Kacang merah, Kacang peudjit, Kacang tunggak, Sadaek sa, Sandaek khmau, Sandaek kraham, Thwax sienx, Thua khaao, Thua rai, Po-thoh-saa, Dau ca, Dau trang, Dau do.
Editor	
Ecocrop code	17651

Description

A spreading, sub-erect or erect herbaceous legume reaching 15-80 cm in height with 7.5-12 cm long pods.

Uses

It is grown for seed and as a vegetable. Dried seeds are used whole or split, while tender green pods are consumed as a vegetable. The plant also makes a good forage, hay, silage and green manure.

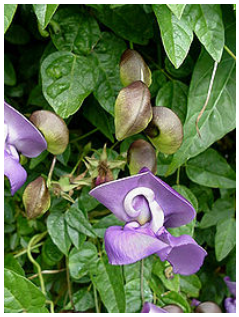
Growing period

Annual legume, pods mature in about 80 days.

Further information

Sowpea is native of India and Sri Lanka. On rich soil, vegetative growth is excessive and seed yield low, soils of medium fertility best suited for seed crop. Yields of dry seeds may in India be 1-2.5 t/ha.

D.3 *Vigna unguiculata* ssp. *dekindtiana*



Authority	(L.) Walp. [(Harms) Verdc.]
Family	Magnoliopsida:Rosidae:Fabales:Leguminosae
Synonyms	*Vigna alba* (G. Don) Baker f., *Vigna baoulensis* A. Chev., *Vigna coerulea* Baker, *Vigna dekindtiana* Harms, *Vigna hispida* (E. Meyer) Walp., *Vigna malosana* Baker, *Vigna scabrida Burtt* Davy
Common names	Blackeyed pea
Editor	
Ecocrop code	10833

D.4 *Vigna unguiculata* ssp. *pubescens*

Authority	
Family	Magnoliopsida:Rosidae:Fabales:Leguminosae
Synonyms	
Common names	
Editor	
Ecocrop code	17643

D.5 *Vigna unguiculata* ssp. *sesquipedalis*

Authority	(L.) Walp. [(L.) Verdc.]
Family	Magnoliopsida:Rosidae:Fabales:Leguminosae
Synonyms	*Dolichos sesquipedalis*, *Vigna sesquipedalis* (L.) Fruw., *Vigna sinensis* (L.) Hassk. ssp. *sesquipedalis* (L.)
Common names	Asparagus bean, Pea bean, Yard bean, Banor, Bodi bean, Boucouson, Cheong dau-kok, Ch`eung kong tau, Dolico gigante, Dolique asperge, Dolique de Cuba, Dolique de Chine, Dolique geant, Dau dua, Dau giai ao, Fagiolo asparagio, Habichuela China, Hamtak, Haricot kilometre, Increase pea, Judia asparaga, Jurokusasage, Kachang belut, Kachang panjang, Kachang perut ayam, Kacang belut, Long bean, Polon-me, Rounceval pea, Sitao, Six weeks bean, Snake bean, Sandaek troeung, Too-afuk yaou, Tua kok, Tua fak yaow, Tua phnom, Yardlong bean, String bean, Vegetable cowpea, Frijol de ojo negro.
Editor	
Ecocrop code	10834

Description

A dwarf or climbing, herbaceous legume. Climbing forms may reach a length of up to 2-4 m. Flowers are yellow or violet and pods 30-100 cm long and more or less inflated and flabby when young.

Uses

Immature pods and seeds are used as a green boiled vegetable. Seeds can be canned, frozen, and dehydrated and are used as a pulse, ground as a meal, or roasted and used as a coffee substitute. The beans are rich in vitamin A, protein, carbohydrates, lysine, and tryptophan. Leaves are used as a pod herb. Green plants are used as fodder or as green manure.

Growing period

Annual. Green pods from early-maturing cultivars may be harvested 50-70 days from sowing, and long-duration cultivars may take 100-120 days to produce pods. Seeds are likely to mature in 60-150 days.

Further information

Asparagus bean is thought to have originated in southern or southeastern Asia, possibly from southern China. It can in the tropics be grown at altitudes up to 700-1000 m, and it is suited for regions with high humidity, though heavy rainfall may damage emerging or young plants and reduce flowering. Average yields are variable 1.5-8 t/ha of fresh pods or 400-750 kg/ha of dried seeds. Yields may, however, be up to 15-30 t/ha and under greenhouse cultivation the crop as produced up to 8 kg/m^2.

D.6 *Vigna unguiculata* ssp. *stenophylla*

Authority	(L.) Walp. [(Harvey) Marechal et al.]
Family	Magnoliopsida:Rosidae:Fabales:Leguminosae
Synonyms	*Vigna angustifoliolata* Verdc., *Vigna stenophylla* (Harvey) Burtt Davy
Common names	cowpea, cow pea
Editor	
Ecocrop code	11426

D.7 *Vigna unguiculata* ssp. *unguiculata*

Authority	(L.) Walp.
Family	Magnoliopsida:Rosidae:Fabales:Leguminosae
Synonyms	*V. sinensis*, *Dolichos unguiculatus*, *D. sinensis*.
Common names	Cowpea, Southern pea, Black-eyed pea, Black-eye bean, Crowder pea, China pea, Pois a vache, Dolique de vaca, Judia tropical, Waken gizo, Gayan gayan, Mkundemwitu, Cowgram, Catjang, Adagura, Adoguari, Afunat habakar, Agwa, Akide enu, Akidiani, Ambalophassula, Amuli, Atera argobba, Bannette, Barbata, Batong, Boo-ngor, Calavance, Callivance, Catjangbohne, Caupi, Chaula, Chavli, Chicharo de vaca, Chowlee, Chowli, Cornfield pea, Coupe, Dagarti bean, Dau den, Dau tang, Dau xa, Dau tua, Digir, Dinawa, Dolico, Dolique de Chine, Dolique indigene, Dolique mongette, Dolique mougette, Eka-wohe, Enkoole, Enkoore,

Ere, Ervilha de vaca, Fagiolino dall'occhio, Fasolea-dima, Feijao brabham, Feijao de China, Feijao de corda, Feijao fradinho, Feijao makunda, Frijol carti, Frijol de ojo negro, Frijol precioso, Gaisa, Halifax pea, Haricot a oeil noir, Haricot dolique, Harricot indigene, Haricot kunde, Hindu pea, Ilanda, Imare, Indian pea, Kachang bol, Kachang panjang, Kachang tunggak, Kachang tonggak, Kacang merah, Kaffer boon, Kaffir bean, Karakala, Katjang merah, Kibal, Kunde, Laputu, Lobia, Loputa, Lubia, Lubya baladi, Marble pea, Me-karal, Ngeri, Nguno, Niebe, Nori, Nyemba bean, Nyorai, Omugobe, Otang, Otong, Paythenkai, Pois de Brazil, Poncho, Poona pea, Porotito del ojo, Sandaek kang, Sandaek engkuy, Sai dau-kok, Sasage, Thwax do, Taukok, Thattapayru, Tonkin pea, Tua dam, Vigna einese, Voamba, Voehm, Voeme, Wuch.

Editor

Ecocrop code 10835

Description

A spreading, suberect or erect, prostrate or climbing herbaceous legume reaching 15-80 cm in height with white or purple flowers and 10-30 cm long pods.

Killing temperature

Mature plants cannot tolerate frost and young plants are susceptible to various injuries when exposed to 5-10°C for 24 hours.

Growing period

Annual, that produce pods in 60-160 days and seeds in 90-180 or up to 240 days. Flowers in early summer and fruits in mid and late summer.

Further information

Cowpea is almost certainly of tropical African origin. It is grown between 30°N and S and it can in East Africa be grown at altitudes up to about 1500 m. Soils of high fertility usually result in high yields of hay, but poor seed yields, while on light sandy soils heavy infestation of nematodes is liable to occur. Cowpea is susceptible to diseases under humid conditions. The optimal photoperiod for induction of flowering is from 8-14 hours. Photosynthesis pathway C3 II. Seed yields in Africa are often as low as 100-300 kg/ha, although experimental yields of up to 4 t/ha have been reported. Mentioned as a useful agroforestry species.

D.8 Overview and history

Cowpea (*Vigna unguiculata* L. Walp.), an annual legume, is also commonly referred to as southern pea, blackeye pea, crowder pea and internationally as lubia, niebe, coupe or frijole. Cowpea originated in Africa and is widely grown in Africa, Latin America, Southeast Asia and in the southern United States. It is chiefly used as a grain crop, for animal fodder, or as a vegetable. The history of cowpea dates to ancient West African cereal farming, 5 to 6 thousand years ago, where it was closely associated with the cultivation of sorghum and pearl millet. Now it is a broadly adapted and highly variable crop, cultivated around the world primarily as a pulse, but also as a vegetable (both for the greens and the green peas), a cover crop, and for fodder. However, they are all the species *Vigna unguiculata* (L.) Walp., which in older references may be identified as *Vigna sinensis* (L.). The largest acreage is in Africa, with Nigeria and Niger predominating, but Brazil, West Indies, India, United States, Burma, Sri Lanka, Yugoslavia, and Australia all have significant production. Dry seed production is estimated at 1.24 million tons annually.

Cowpea is considered more tolerant to heat and drought than even soybeans or mung beans, due to its tendency to form a deep tap root. By nature the plant is a vine, hence the best breeding opportunities for modem agriculture systems is with the more determinate and bush types, although for forage or cover crop applications the vine characteristic is preferred. Cowpeas may reach a canopy height of 75 cm–90 cm. However, more determinate types will be around 50 cm–60 cm, and it is likely the indeterminate types will vine at that same height resulting in no further increase of the canopy height. The seed pods are borne above the leaf axil, thus the pods are very visible. The seed pod is typically 7.5 cm to 15 cm long and has 6 to 13 seeds per pod. The seed weight per bushel is 27.24 kg with about 3000 to 4000 seeds per 454 g.

The germination of the seed is rapid at soil temperatures above 18 °C. The preferred early maturing varieties will set pods in about 60 days and mature in 90 to 100 days. Leaves will dry down but may not drop off completely.

Due to its drought tolerance, cowpea has a competitive niche in soils that are sandy. Cowpea does not tolerate excessively wet conditions, and should not be grown on poorly drained soils.

D.9 Uses

Uses

The use of the dried blackeye or purpleeye types is for food products. The seeds, shelled green or dried, are edible and used as stock food or in soups. The pulses can be ground into meal or roasted as a substitute for coffee. Plant leaves are high in vitamin A. Young pods and leaves are eaten as green vegetables. The plant is used for pasture, hay, silage and green manure.

Another common product is the canned product, which is cooked with water prior to canning. Cowpea is considered nutritious with a protein content of about 23%, fat content of 1.3%, fibre content of 1.8%, carbohydrate content of 67% and water content of 8–9%. As in most legumes, the amino acid profile complements cereal grains.

Nutrient content of cowpea seed is summarized in Table D.1.

Table D.1 — Nutrient content of mature cowpea seed (average of eight varieties)[1]

Protein	24.8%
Fat	1.9%
Fibre	6.3%
Carbohydrate	63.6%
Thiamine	0.00074%
Riboflavin	0.00042%
Niacin	0.00281%

[1]From Bressani R. Chap. 28 in Cowpea Research, Production and Utilization, Wiley and Sons.

The protein in cowpea seed is rich in the amino acids, lysine and tryptophan, compared to cereal grains; however, it is deficient in methionine and cystine when compared to animal proteins. Therefore, cowpea seed is valued as a nutritional supplement to cereals and an extender of animal proteins.

Cowpea can be used at all stages of growth as a vegetable crop. The tender green leaves are an important food source in Africa and are prepared as a pot herb, like spinach. Immature snapped pods are used in the same way as snapbeans, often being mixed with other foods. Green cowpea seeds are boiled as a fresh vegetable, or may be canned or frozen. Dry mature seeds are also suitable for boiling and canning.

In many areas of the world, the cowpea is the only available high quality legume hay for livestock feed. Digestibility and yield of certain cultivars have been shown to be comparable to alfalfa. Cowpea may be used green or as dry fodder. It also is used as a green manure crop, a nitrogen fixing crop, or for erosion control. Similar to other grain legumes, cowpea contains trypsin inhibitors which limit protein utilization.

D.10 Growth habits

Cowpea is a warm-season, annual, herbaceous legume. Plant types are often categorized as erect, semi-erect, prostrate (trailing), or climbing. There is much variability within the species. Growth habit ranges from indeterminate to fairly determinate with the non-vining types tending to be more determinate. Cowpea generally is strongly taprooted. Root depth has been measured at 241.3 cm 8 weeks after seeding.

Cowpea seed ranges in size from the very small wild types up to 35 cm long and the number of seeds per 500 g range from 1600 to 4300. Seed shape is a major characteristic correlated with seed development in the pod. Seeds develop a kidney shape if not restricted within the pod. When seed growth is restricted by the pod the seed becomes progressively more globular.

The seed coat can be either smooth or wrinkled and of various colours including white, cream, green, buff, red, brown, and black. Seed may also be speckled, mottled, or blotchy. Many are also referred to as "eyed" (blackeye, pinkeye purple hull, etc.) where the white coloured hilum is surrounded by another colour.

Emergence is epigeal (similar to common bean, and lupin) where the cotyledons emerge from the ground during germination. This type of emergence makes cowpea more susceptible to seedling injury, since the plant does not regenerate buds below the cotyledonary node.

The trifoliolate leaves develop alternately. Leaves are smooth, dull to shiny, and rarely pubescent. Commonly, the terminal leaflet is longer and larger than the lateral leaflets. There is a wide range in leaf size and shape.

Cowpea generally is day neutral. Flowers are borne in multiple racemes on 20 cm to 50 cm flower stalks (peduncles) that arise from the leaf axil. Two or three pods per peduncle are common and often four or more pods are carried on a single peduncle. The presence of these long peduncles is a distinguishing feature of cowpea and this characteristic also facilitates harvest. The open display of flowers above the foliage and the presence of floral nectaries contribute to the attraction of insects. Cowpea primarily is self pollinating.

Cowpea pods are smooth, 15 cm to 25 cm long, cylindrical and generally somewhat curved. As the seeds approach the green-mature stage for use as a vegetable, pod colour may be distinctive, most commonly green, yellow or purple. As the seeds dry, pod colour of the green and yellow types becomes tan or brown.

D.11 Environment requirements

D.11.1 Climate

Cowpea is a warm-season crop well adapted to many areas of the humid tropics and temperate zones. It tolerates heat and dry conditions, but is intolerant of frost. Germination is rapid at temperatures above 18 °C; colder temperatures slow germination.

Cowpeas are grown under both irrigated and non-irrigated regimes. The crop responds positively to irrigation but will also produce well under dryland conditions. Cowpea is more drought resistant than common bean. Drought resistance is one reason that cowpea is such an important crop in many underdeveloped parts of the world. If irrigation is used, more vegetative growth and some delay in maturity may result. Application rates should insure that the crop is not overwatered, especially in more northern latitudes, as this will suppress growth by lowering soil temperatures. The most critical moisture requiring period is just prior to and during bloom.

D.11.2 Soil

Cowpea performs well on a wide variety of soils and soil conditions, but performs best on well-drained sandy loams or sandy soils where soil pH is in the range of 5.5 to 6.5.

D.12 Cultural practices

D.12.1 Seedbed preparation

Soils should be cultivated deeply enough to insure that no barrier to penetration of the soil by the taproot (such as a hardpan) exists. Cowpea may be adversely affected by soil crusting under certain soil and environmental conditions.

D.12.2 Seeding date

Cowpea should not be planted until soil temperatures are consistently above 18 °C and soil moisture is adequate for germination and growth. Seeds will decay in cool, wet soils.

D.12.3 Method and rate of seeding

Optimum plant spacing depends on vine type. Highly determinate types may be planted 5 to 7.5 cm apart. Viney indeterminate types require more space, and a final stand with 20 to 23 cm between plants in 75 cm rows is considered to be a minimally acceptable population.

D.12.4 Fertility and lime requirements

Cowpea, like all legumes, forms a symbiotic relationship with a specific soil bacterium (*Rhizobium* spp.). *Rhizobium* makes atmospheric nitrogen available to the plant by a process called nitrogen fixation. Fixation occurs in root nodules of the plant and the bacteria utilize sugars produced by the plant. Although cowpea *Rhizobium* is normally widespread, seed inoculation with *Rhizobium* specific to cowpea would be beneficial in areas where it is not present. Always use *Rhizobium* of the cowpea type.

Excess nitrogen (N) promotes lush vegetative growth, delays maturity, may reduce seed yield and may suppress nitrogen fixation. The plant will perform well under low N conditions due to a high capacity for N fixation. A starter N rate of around 12 kg/acre is sometimes required for early plant development on low-N soils.

A soil test is the best way to determine soil nutrient levels. In general, at least 12 kg P/acre and 18 kg K/acre are recommended on soils of medium fertility but individual soils will vary in fertilizer requirements. Band fertilizer 7.5 cm to 10 cm deep and 5 cm to 7.5 cm away from the seed, or broadcast and disc in all fertilizer, including nitrogen, before planting.

D.12.5 Variety selection

The International Institute for Tropical Agriculture (IITA) in Ibadan, Nigeria is the centre for world-wide collection and testing of cowpea germplasm. The Institute has developed high yielding, short season, multiple disease-resistant varieties that are ready for harvest in 60 days.

The extreme variability of the species has led to a number of commercial cultivars grouped by the variance in bean shape, size, and colour.

Black eye and purple eye—The immature pods shell easily because the hull (pod wall) is pliable and the seeds come out of the pod clean and free. The shelled peas are attractive, mild flavoured and suitable for processing. The white hilum is surrounded by black, pink, or light-red. The seeds are not tightly packed or 'crowded' in the pod and are kidney or oblong in shape.

Brown eye—Pods vary in colour from green to lavender and have a wide range of lengths. The immature seeds, when cooked, are a medium to dark brown colour, very tender, and have a delicate flavour.

Crowder— Seeds are black, speckled, and brown or brown-eyed. The seeds are 'crowded' in the pod, hence the name and also tend to be globular in shape.

Cream—Seeds of these types are generally cream coloured and have no noticeable "eye" (the hilum is inconspicuous). This is an intermediate between blackeye and crowder types.

Clay—These are generally older varieties that are medium to dark brown in color and kidney shaped. They are no longer commonly grown.

White acre—The peas are kidney shaped with a blunt end. This type is a semi-crowder, generally tan in colour and somewhat small. Pods are stiff and the seeds tend to be small.

Forage cultivars—Adapted for use as fodder, or cover crop use.

For crop breeding uses these various types may be crossed to give desired characteristics. For instance the southern pea varieties have used various blackeye, crowder, and cream types for this fresh green seed or green pod market. Choice of market class, and approach to narrow or wide rows can affect which variety to choose.

D.12.6 Weed control

Adequate weed control is necessary for good growth and high yields. This can be done by mechanical or chemical means.

D.12.7 Diseases and their control

Root rot and damping off are caused by three different fungi. Symptoms vary and include rapid death of young succulent plants, discoloration of taproots, longitudinal cracks of the stems, stunting, wilting and poor yields. Complete control of root rot and damping off is difficult, and no variety of cowpea is resistant to root rot. Persistent damp weather prior to development of the first true leaf and also the crowding of seedlings due to poor seed spacing may increase damping off. The following control practices help reduce losses from these diseases:

Fungal and viral diseases can be reduced by:

— treating high quality seed with fungicides labelled for cowpeas.

— applying cowpea-labelled fungicides in the furrow.

— avoiding throwing soil against plant steins during cultivation.

— a four or five year rotation with other crops.

— seeding into warm, well-prepared soils.

— planting certified seed of resistant varieties.

— controlling weeds.

— the removal of virus-affected plants.

Southern blight is caused by a fungus that attacks roots and stems of cowpeas. The first visible symptom of southern blight is a progressive, yellowing and wilting of the foliage beginning on the lower leaves. The plant dies within a few days after the rust symptoms appear. A brownish vascular discoloration inside die stem may extend several inches above the soil line. During warm, moist conditions, the coarse, white mycelium of the fungus makes characteristic fan-shaped patterns of growth on the stem at the soil line. In this white-mat of the fungus, numerous smooth, round, light-tan to dark-brown mustard seed-like bodies called sclerotia are formed. In addition to the cultural practices listed above, bury previous crop debris and the sclerotia, at least 6 in. deep as far ahead of planting as possible.

Several viruses can attack cowpea. A characteristic symptom of the mosaic virus disease is an intermixing of light and dark-brown areas. Mottled areas are irregular in outline and may follow the

main veins. Infected leaves are generally smaller than healthy ones, and often there is a slight puckering and curling of leaf edges. Infected plants usually are more dwarfed and bushy and yields are reduced. Mosaic diseases can also result in malformed pods. Plants infected during seedling stages may be barren and fail to produce. The best way to prevent large yield losses from virus diseases is to grow tolerant varieties.

Fusarium wilt usually causes the lower leaves on one side of the plant to turn yellow. Infected plants usually are stunted and wilted as the organism develops in the food and water conducting tissues. Brick red tissue can be observed in the stem when it is split lengthwise. The best control of Fusarium wilt is the use of resistant varieties. When resistant varieties are not used, it is important that root-knot nematode control practices be followed since nematodes increase plant susceptibility to Fusarium wilt.

D.12.8 Insects and other predators and their control

Root-knot nematodes cause the root to appear knotted and galled. Above ground nematode symptoms appear as nutrient deficiencies, with stunting and often wilting because the root system is incapable of absorbing adequate amounts of water and nutrients. Do not confuse nematode root symptoms with the nodules of nitrogen fixing bacteria. Nodules are attached to sides of roots, and galls are within the roots. Root-knot nematodes can also be harmful to the cowpea because root injuries make the plants much more susceptible to attack by Fusarium wilt. In addition to detecting the presence of nematodes by observing galled roots, they can be detected by a soil test for nematodes. If nematodes are present certain practices help reduce nematode populations. These practices include crop rotation, fallowing, sanitation, weed control, and planting resistant varieties.

Cowpea curculio is a small weevil that causes blister-like spots on the surface of the pod. These spots result from adults puncturing the pod to feed on or to lay eggs. Punctures from feeding result in small malformed peas, and the results of egg laying are many legless grubs that destroy developing peas.

Aphids are small, green, soft-bodied insects that feed by piercing the plant tissue and withdrawing plant juices. Infestations of this pest develop on leaves and the fruiting stems. Their feeding, especially on the fruiting stem reduces the amount of plant nutrients available for pod and pea development. Infested foliage turns yellow and dies. Aphids excrete large quantities of a sugary substance called honey dew which supports the growth of sooty mould. Sooty mould, a fungus, is dark in colour, which reduces the amount of sunlight that reaches the leaf. Mild damp weather favours development of aphid populations.

Green stink bugs cause damage by puncturing the pods and feeding on developing peas. The lesser cornstalk borer and possibly other borers may be a problem, especially where cowpeas border fields of maturing corn or sorghum. Lesser cornstalk borer damage may be significantly reduced by clean cultivation at least two weeks prior to planting. In some cases, some damage may be experienced from the European corn borer.

D.12.9 Harvesting

Cowpea can be harvested at three different stages of maturity: green snaps, green-mature, and dry. Depending on temperature, fresh-market (green-mature) peas are ready for harvest 16 to 17 days after bloom (60 to 90 days after planting). Harvest date for green snap pods is normally specified by the processor. Mechanical harvest requires the use of a snap bean or green pea harvester. Hand harvested cowpeas suffer less damage and the harvest season may continue over a 1 to 3 week period. One person can hand harvest 12 to 20 bushels of cowpea pods per day. Cowpea pods are packed, 25 pounds net, in bushel hampers or mesh bags (not burlap sacks).

For the whole seed market, quality of seed is important, so care in harvest and post-harvest handling may be important to avoid cracked or split seed. Handling the product at a higher moisture reduces splitting of the seeds. If the leaves are still green at the time pods mature, Gramaxone may be applied as a harvest aid. Cowpea grown as a dried pea product can be direct combined using a platform head or a row crop head. Adjustments to combine settings, and possibly screen/sieve sizes, should be made for the cowpea seed. It is slightly larger than soybeans and kidney shaped. The grain can be stored short term at around 12% moisture or less, with 8 to 9% recommended for long-term storage.

Some buyers will want the seed cleaned and bagged, while others will take the grain in bulk form and clean it themselves. When sold for the processing market, cowpeas are frequently sold at harvest by the truckload, at a higher moisture—17% and less being accepted for delivery. The product may benefit from a coarse cleaning process after harvesting to remove foreign material. It should then be delivered quickly (one day or less) to prevent quality degradation. Cowpeas are checked for discoloured seeds, as well as foreign material and the payment adjusted accordingly. Product may be rejected if there are too many discoloured, broken or cracked seeds.

D.12.10 Drying and storage

Harvested green cowpeas will "heat" resulting in spoilage unless kept cool. Post-harvest, provide shade and adequate ventilation is necessary on the way to the cooler. Cowpeas cooled below 7 °C may show chilling injury.

Dry cowpea seed is cleaned, graded, fumigated and packed in small plastic bags for sale to consumers.

Annex E
(informative)

Cowpeas — Codex, EU and USA pesticide residue limits

Users are advised that international regulations and permissible Maximum Residue Levels (MRL) frequently change. Although this International MRL Database is updated frequently, the information in it may not be completely up-to-date or error free. Additionally, commodity nomenclature and residue definitions vary between countries, and country policies regarding deferral to international standards are not always transparent. This database is intended to be an initial reference source only, and users must verify any information obtained from it with knowledgeable parties in the market of interest prior to the sale or shipment of any products. The developers of this database are not liable for any damages, in whole or in part, caused by or arising in any way from user's use of the database.

Results Key

MRL values in *{Italics}* are more restrictive than US
--- indicates no MRL value is established.
Cod, EU, etc. indicates the source of the MRL and EXP means the market defers to the exporting market.
All numeric values listed are in parts per million (ppm), unless otherwise noted

	US	**Cod**	**EU *1***
2,4-D	---	---	0.05
	1. European Union does not maintain a specific MRL for the 2,4-D/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Vegetables Fresh or Frozen" group.		
	US *2*	**Cod**	**EU *3***
Acetamiprid	0.4	---	*{0.01}*
	2. United States does not maintain a specific MRL for the Acetamiprid/Cowpea combination, but does maintain an MRL of 0.4 PPM for its "Pea and Bean, Succulent Shelled, Subgroup, 6B" group.		
	3. European Union does not maintain a specific MRL for the Acetamiprid/Cowpea combination, but does maintain an MRL of 0.01 PPM for its "Legume vegetables (fresh)" group.		
	US *4*	**Cod**	**EU *5***
Acetochlor	---	---	0.01
	4. MRL applies to indirect or inadvertent residues only.		
	5. European Union does not maintain a specific MRL for the Acetochlor/Cowpea combination, but does maintain an MRL of 0.01 PPM for its "Legume vegetables (fresh)" group.		
	US *6*	**Cod**	**EU**
Azoxystrobin	0.5	---	*{0.2}*
	6. United States does not maintain a specific MRL for the Azoxystrobin/Cowpea combination, but does maintain an MRL of 0.5 PPM for its "Pea and Bean, Dried Shelled, Except Soybean, Subgroup 6C" group.		
	US	**Cod**	**EU**
Benoxacor	0.01	---	---
	US *7*	**Cod**	**EU**
Beta-cyfluthrin	0.15	---	---
	7. United States does not maintain a specific MRL for the Beta-cyfluthrin/Cowpea combination, but does maintain an MRL of 0.15 PPM for its "Pea and Bean, Dried Shelled, Except Soybean, Subgroup 6C" group.		
	US *8*	**Cod**	**EU *9***
Bifenazate	0.7	---	*{0.01}*
	8. United States does not maintain a specific MRL for the Bifenazate/Cowpea combination, but does maintain an MRL of 0.7 PPM for its "Pea and Bean, Succulent Shelled, Subgroup, 6B" group.		
	9. European Union does not maintain a specific MRL for the Bifenazate/Cowpea combination, but does maintain an MRL of 0.01 PPM for its "Legume vegetables (fresh)" group.		
	US *10*	**Cod**	**EU**
Bifenthrin	0.05	---	0.05
	10. United States does not maintain a specific MRL for the Bifenthrin/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Pea and Bean, Succulent Shelled, Subgroup, 6B" group.		
	US	**Cod**	**EU**
Boscalid	---	---	2

	US *11*	**Cod**	**EU**
Captan	0.05	---	2
	11. United States does not maintain a specific MRL for the Captan/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Vegetable, Legume, Group 6" group.		
	US *12*	**Cod**	**EU *13***
Carbaryl	1	---	*{0.05}*
	12. United States does not maintain a specific MRL for the Carbaryl/Cowpea combination, but does maintain an MRL of 1 PPM for its "Pea and Bean, Dried Shelled, Except Soybean, Subgroup 6C" group.		
	13. European Union does not maintain a specific MRL for the Carbaryl/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Legume vegetables (fresh)" group.		
	US *14*	**Cod**	**EU *15***
Carfentrazone-ethyl	0.1	---	*{0.01}*
	14. United States does not maintain a specific MRL for the Carfentrazone-ethyl/Cowpea combination, but does maintain an MRL of 0.1 PPM for its "Vegetable, Legume, Group 6" group.		
	15. European Union does not maintain a specific MRL for the Carfentrazone-ethyl/Cowpea combination, but does maintain an MRL of 0.01 PPM for its "Vegetables Fresh or Frozen" group.		
	US *16*	**Cod**	**EU *17***
Chlorpyrifos	0.05	---	0.05
	16. United States does not maintain a specific MRL for the Chlorpyrifos/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Vegetable, Legume, Group 6" group. 17. European Union does not maintain a specific MRL for the Chlorpyrifos/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Legume vegetables (fresh)" group.		
	US	**Cod**	**EU *18***
Clethodim	3.5	---	*{0.5}*
	18. European Union does not maintain a specific MRL for the Clethodim/Cowpea combination, but does maintain an MRL of 0.5 PPM for its "Legume vegetables (fresh)" group.		
	US *19*	**Cod**	**EU *20***
Cyfluthrin	0.15	---	*{0.05}*
	19. United States does not maintain a specific MRL for the Cyfluthrin/Cowpea combination, but does maintain an MRL of 0.15 PPM for its "Pea and Bean, Dried Shelled, Except Soybean, Subgroup 6C" group. 20. European Union does not maintain a specific MRL for the Cyfluthrin/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Legume vegetables (fresh)" group.		
	US	**Cod**	**EU**
Cyromazine	---	---	0.05
	US	**Cod**	**EU *21***
Endosulfan	2	---	*{0.05}*
	21. European Union does not maintain a specific MRL for the Endosulfan/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Legume vegetables (fresh)" group.		
	US	**Cod**	**EU *22***
Etridiazole	0.1	---	*{0.05}*
	22. European Union does not maintain a specific MRL for the Etridiazole/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Legume vegetables (fresh)" group.		
	US *23*	**Cod**	**EU *24***
Fluazinam	0.02	---	0.05
	23. United States does not maintain a specific MRL for the Fluazinam/Cowpea combination, but does maintain an MRL of 0.02 PPM for its "Pea and Bean, Dried Shelled, Except Soybean, Subgroup 6C" group. 24. European Union does not maintain a specific MRL for the Fluazinam/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Vegetables Fresh or Frozen" group.		
	US *25*	**Cod *26***	**EU**
Fludioxonil	0.01	0.03	0.2
	25. United States does not maintain a specific MRL for the Fludioxonil/Cowpea combination, but does maintain an MRL of 0.01 PPM for its "Vegetable, Legume, Group 6" group.		
	26. Codex does not maintain a specific MRL for the Fludioxonil/Cowpea combination, but does maintain an MRL of 0.03 PPM for its "Peas, shelled (succulent seeds)" group.		

	US *27*	**Cod**	**EU *28***
Fluoride	70	---	*{2}*
	27. United States does not maintain a specific MRL for the Fluoride/Cowpea combination, but does maintain an MRL of 70 PPM for its "Vegetable, Legume, Group 6" group.		
	28. European Union does not maintain a specific MRL for the Fluoride/Cowpea combination, but does maintain an MRL of 2 PPM for its "Vegetables Fresh or Frozen" group.		
	US	**Cod**	**EU**
Gamma Cyhalothrin	0.01	---	---
	US *29*	**Cod**	**EU *30***
Glyphosate	5	---	*{0.1}*
	29. United States does not maintain a specific MRL for the Glyphosate/Cowpea combination, but does maintain an MRL of 5 PPM for its "Vegetable, Legume, Group 6" group.		
	30. European Union does not maintain a specific MRL for the Glyphosate/Cowpea combination, but does maintain an MRL of 0.1 PPM for its "Legume vegetables (fresh)" group.		
	US *31*	**Cod**	**EU**
Imazethapyr	0.1	---	---
	31. United States does not maintain a specific MRL for the Imazethapyr/Cowpea combination, but does maintain an MRL of 0.1 PPM for its "Vegetable, Legume, Group 6" group.		
	US *32*	**Cod**	**EU**
Imidacloprid	4	---	*{2}*
	32. United States does not maintain a specific MRL for the Imidacloprid/Cowpea combination, but does maintain an MRL of 4 PPM for its "Vegetable, Legume, Group 6" group.		
	US	**Cod**	**EU *33***
Inorganic bromide resulting from fumigation	50	---	*{30}*
	33. European Union does not maintain a specific MRL for the Inorganic bromide resulting from fumigation/Cowpea combination, but does maintain an MRL of 30 PPM for its "Legume vegetables (fresh)" group.		
	US *34*	**Cod**	**EU *35***
Ipconazole	0.01	---	0.01
	34. United States does not maintain a specific MRL for the Ipconazole/Cowpea combination, but does maintain an MRL of 0.01 PPM for its "Pea and Bean, Dried Shelled, Except Soybean, Subgroup 6C" group.		
	35. European Union does not maintain a specific MRL for the Ipconazole/Cowpea combination, but does maintain an MRL of 0.01 PPM for its "Vegetables Fresh or Frozen" group.		
	US *36*	**Cod**	**EU**
Lambda Cyhalothrin	0.01	---	0.02
	36. United States does not maintain a specific MRL for the Lambda Cyhalothrin/Cowpea combination, but does maintain an MRL of 0.01 PPM for its "Pea and Bean, Succulent Shelled, Subgroup, 6B" group.		
	US	**Cod**	**EU *37***
Malathion	8	---	*{0.02}*
	37. European Union does not maintain a specific MRL for the Malathion/Cowpea combination, but does maintain an MRL of 0.02 PPM for its "Legume vegetables (fresh)" group.		
	US *38*	**Cod *39***	**EU *40***
Metalaxyl	0.2	*{0.05}*	*{0.05}*
	38. United States does not maintain a specific MRL for the Metalaxyl/Cowpea combination, but does maintain an MRL of 0.2 PPM for its "Vegetable, Legume, Group 6" group.		
	39. Codex does not maintain a specific MRL for the Metalaxyl/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Peas, shelled (succulent seeds)" group.		
	40. European Union does not maintain a specific MRL for the Metalaxyl/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Legume vegetables (fresh)" group.		
	US *41*	**Cod**	**EU**
Methoxyfenozide	0.2	---	*{0.02}*
	41. United States does not maintain a specific MRL for the Methoxyfenozide/Cowpea combination, but does maintain an MRL of 0.2 PPM for its "Pea and Bean, Succulent Shelled, Subgroup, 6B" group.		

	US *42*	**Cod**	**EU *43***
Metolachlor	0.1	---	*{0.05}*
	42. United States does not maintain a specific MRL for the Metolachlor/Cowpea combination, but does maintain an MRL of 0.1 PPM for its "Pea and Bean, Dried Shelled, Except Soybean, Subgroup 6C" group.		
	43. European Union does not maintain a specific MRL for the Metolachlor/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Vegetables Fresh or Frozen" group.		
	US *44*	**Cod**	**EU *45***
Paraquat dichloride	0.05	---	*{0.02}*
	44. United States does not maintain a specific MRL for the Paraquat dichloride/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Vegetable, Legume, Edible Podded, Subgroup 6A" group.		
	45. European Union does not maintain a specific MRL for the Paraquat dichloride/Cowpea combination, but does maintain an MRL of 0.02 PPM for its "Vegetables Fresh or Frozen" group.		
	US	**Cod**	**EU *46***
Pendimethalin	0.1	---	0.2
	46. European Union does not maintain a specific MRL for the Pendimethalin/Cowpea combination, but does maintain an MRL of 0.2 PPM for its "Legume vegetables (fresh)" group.		
	US *47*	**Cod**	**EU *48***
Phosphine	0.01	---	0.05
	47. United States does not maintain a specific MRL for the Phosphine/Cowpea combination, but does maintain an MRL of 0.01 PPM for its "Vegetable, Legume, Group 6" group.		
	48. European Union does not maintain a specific MRL for the Phosphine/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Legume vegetables (fresh)" group.		
	US	**Cod**	**EU**
Piperonyl Butoxide	8	---	---
	US *49*	**Cod**	**EU *50***
Prothioconazole	0.9	---	*{0.02}*
	49. United States does not maintain a specific MRL for the Prothioconazole/Cowpea combination, but does maintain an MRL of 0.9 PPM for its "Pea and Bean, Dried Shelled, Except Soybean, Subgroup 6C" group. 50. European Union does not maintain a specific MRL for the Prothioconazole/Cowpea combination, but does maintain an MRL of 0.02 PPM for its "Vegetables Fresh or Frozen" group.		
	US *51*	**Cod**	**EU *52***
Pyraclostrobin	0.5	---	*{0.02}*
	51. United States does not maintain a specific MRL for the Pyraclostrobin/Cowpea combination, but does maintain an MRL of 0.5 PPM for its "Vegetable, Legume, Edible Podded, Subgroup 6A" group. 52. European Union does not maintain a specific MRL for the Pyraclostrobin/Cowpea combination, but does maintain an MRL of 0.02 PPM for its "Legume vegetables (fresh)" group.		
	US *53*	**Cod**	**EU *54***
Pyriproxyfen	0.2	---	*{0.05}*
	53. United States does not maintain a specific MRL for the Pyriproxyfen/Cowpea combination, but does maintain an MRL of 0.2 PPM for its "Vegetable, Legume, Group 6" group. 54. European Union does not maintain a specific MRL for the Pyriproxyfen/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Legume vegetables (fresh)" group.		
	US *55*	**Cod**	**EU *56***
S-metolachlor	0.1	---	*{0.05}*
	55. United States does not maintain a specific MRL for the S-metolachlor/Cowpea combination, but does maintain an MRL of 0.1 PPM for its "Pea and Bean, Dried Shelled, Except Soybean, Subgroup 6C" group. 56. European Union does not maintain a specific MRL for the S-metolachlor/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Vegetables Fresh or Frozen" group.		
	US *57*	**Cod**	**EU *58***
Sethoxydim	25	---	*{0.5}*
	57. United States does not maintain a specific MRL for the Sethoxydim/Cowpea combination, but does maintain an MRL of 25 PPM for its "Pea and Bean, Dried Shelled, Except Soybean, Subgroup 6C" group.		
	58. European Union does not maintain a specific MRL for the Sethoxydim/Cowpea combination, but does maintain an MRL of 0.5 PPM for its "Legume vegetables (fresh)" group.		

	US *59*	**Cod**	**EU**
Spinetoram	0.04	---	0.05
	59. United States does not maintain a specific MRL for the Spinetoram/Cowpea combination, but does maintain an MRL of 0.04 PPM for its "Pea and Bean, Succulent Shelled, Subgroup, 6B" group.		
	US *60*	**Cod *61***	**EU**
Spinosad	0.02	0.3	0.3
	60. United States does not maintain a specific MRL for the Spinosad/Cowpea combination, but does maintain an MRL of 0.02 PPM for its "Pea and Bean, Succulent Shelled, Subgroup, 6B" group. 61. Codex does not maintain a specific MRL for the Spinosad/Cowpea combination, but does maintain an MRL of 0.3 PPM for its "Legume vegetables" group.		
	US	**Cod**	**EU**
Sulfentrazone	0.15	---	---
	US *62*	**Cod**	**EU *63***
Sulfuryl fluoride	0.5	---	*{0.01}*
	62. United States does not maintain a specific MRL for the Sulfuryl fluoride/Cowpea combination, but does maintain an MRL of 0.5 PPM for its "Vegetable, Legume, Group 6" group. 63. European Union does not maintain a specific MRL for the Sulfuryl fluoride/Cowpea combination, but does maintain an MRL of 0.01 PPM for its "Vegetables Fresh or Frozen" group.		
	US *64*	**Cod**	**EU**
Thiamethoxam	0.02	---	0.05
	64. United States does not maintain a specific MRL for the Thiamethoxam/Cowpea combination, but does maintain an MRL of 0.02 PPM for its "Vegetable, Legume, Group 6" group.		
	US	**Cod**	**EU *65***
Trifluralin	0.05	---	0.5
	65. European Union does not maintain a specific MRL for the Trifluralin/Cowpea combination, but does maintain an MRL of 0.5 PPM for its "Legume vegetables (fresh)" group.		
	US *66*	**Cod**	**EU *67***
Zeta-Cypermethrin	0.05	---	0.05
	66. United States does not maintain a specific MRL for the Zeta-Cypermethrin/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Pea and Bean, Dried Shelled, Except Soybean, Subgroup 6C" group. 67. European Union does not maintain a specific MRL for the Zeta-Cypermethrin/Cowpea combination, but does maintain an MRL of 0.05 PPM for its "Legume vegetables (fresh)" group.		

Annex F
(informative)

Sieves for assessing dockage and grading factors

Type	Sieve name	Hole size (millimetres)	Manufacturer's designation (inches)
Round-hole	No. 4.5	1.79	4½/64
	No. 5	1.98	5/64
	No. 5.5	2.18	5½/64
	No. 6	2.38	6/64
	No. 6.5	2.58	6½/64
	No. 7	2.78	7/64
	No. 7.5	2.98	7½/64
	No. 8	3.18	8/64
	No. 8.5	3.37	8½/64
	No. 9	3.57	9/64
	No. 10	3.97	10/64
	No. 11	4.37	11/64
	No. 12	4.76	12/64
	No. 14	5.56	14/64
	No. 15	5.95	15/64
	No. 16	6.35	16/64
	No. 17	6.75	17/64
	No. 18	7.14	18/64
	No. 20	7.94	20/64
	No. 21	8.33	21/64
	No. 22	8.73	22/64
	No. 24	9.52	24/64

Type	Sieve name	Hole size (millimetres)	Manufacturer's designation (inches)
Slotted	No. 3	1.19 x 7.94	3/64 x 5/16
	No. 4.5	1.79 x 12.70	4½/64 x 1/2
	No. 5	1.98 x 19.05	5/64 x 3/4
	No. 6	2.38 x 19.05	6/64 x 3/4
	No. 8	3.18 x 19.05	8/64 x 3/4
	No. 9	3.57 x 19.05	9/64 x 3/4
	No. 11	4.37 x 19.05	11/64 x 3/4
	No. 12	4.76 x 19.05	3/16 x 3/4
	No. .064	1.60 x 9.53	0.064 x 3/8
	No. .028	0.71 x 11.90	0.028 x 15/32
	No. .032	0.81 x 11.90	0.032 x 15/32
	No. .035	0.89 x 11.90	0.035 x 15/32
	No. .038	0.96 x 11.90	0.038 x 15/32
	No. .040	1.02 x 11.90	0.040 x 15/32
Buckwheat	No. 5	triangle with 1.98 mm inscribed circle	triangle with 0.078 inscribed circle
	No. 6	triangle with 2.26-mm inscribed circle	triangle with 0.089-inch inscribed circle
Wire	No. 3 x 16	3 x 16 mesh per 25.4 mm	3 x 16 wire mesh per inch
	No. 4 x 14	4 x 14 mesh per 25.4 mm	4 x 14 wire mesh per inch
	No. 10 x 10	10 x 10 mesh per 25.4 mm	10 x 10 wire mesh per inch
	No. 9 x 9	9 x 9 mesh per 25.4 mm	9 x 9 wire mesh per inch