

Urd bean Production Technology



सत्यमेव जयते

Government of India
Ministry of Agriculture & Farmers Welfare
Department of Agriculture Cooperation & Farmers Welfare
Directorate of Pulses Development, Bhopal (M.P.)



एक कदम स्वच्छता की ओर



Per Drop, More Crop

M-kisan portal - <http://mkisan.gov.in>
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Kisan Call Centre (KCC)-Toll Free No.-1800-180-1551

URD BEAN

Botanical Name - *Vigna mungo* (L.) Hepper
 Synonym - Urd, Biri, Mash
 Origin - India



Introduction

Black gram is one of the important pulse crops grown throughout India. It is consumed in the form of 'dal' (whole or split, husked and un-husked) or perched. It is used as nutritive fodder specially for milch animals. It is also green manuring crop. High values of lysine make urdbean an excellent complement to rice in terms of balanced human nutrition.

Nutritive Value

Protein	-	24%	Calcium	-	54 mg/100 g
Fat	-	1.4%	Phosphorus	-	385 mg/100 g
Minerals	-	3.2%	Iron	-	9.1 mg/100 g
Fiber	-	0.9%	Calorific value	-	347 Kcal/100 g
Carbohydrate	-	59.6%	Moisture	-	10.9%

Crop Status

During the twelfth Plan (2012-2015) the total production was 18.29 lakh tonnes on an area of 31.29 lakh hectares. As regards the total contribution from states, Madhya Pradesh stand first in respect of area (19.40%) followed by U.P. (17.88%) and Andhra Pradesh (11.69%), whereas in production U.P. stands first (16.98%) followed by Andhra Pradesh (16.75%) and Madhya Pradesh (15.07%). The highest yield was recorded by the state of Bihar (898 kg/ha) followed by Sikkim (895 kg/ha) and Jharkhand (890 kg/ha) the National yield average was (585 kg/ha). The lowest yield was recorded in the state of C.G. (309 kg/ha) followed by Odisha (326 kg/ha) and J&K (385 kg/ha) (DES, 2015-16).

State-wise recommended varieties

State	Recommended Varieties		
	Kharif	Rabi	Spring/Summer
Andhra Pradesh	Pant Urd-31, IPU 2-43, LBG 685, LBG 625, Tulsi (LBG-787)	TU 94-2, LBG 623, LBG 709, LBG 611, Tulsi (LBG-787)	TU 94-2, LBG 623, LBG 709, LBG 611, Tulsi (LBG-787)
Assam	PU-30, WBU -108, IPU 94-1 (Uttara)	-	-
Bihar & Jharkhand	Pant Urd 31, WBU 108, IPU 94-1 (Uttara), Birs Urd 1, PU-30	-	Pant Urd 31, WBU-109, KU 91-2 (AZAD Urd 1)

Gujarat	KU 96-3, TPU-4, AKU-4 (Melghat), GU-1, KUG-479, UH 01, Mash-414	-	-
Haryana	KU-300 (Shekhar 2), IPU 94-1 (Uttara)	-	-
H.P.	Pant Urd 31, Pant Urd 40	-	-
Karnataka	IPU 02-43, WBU-108, KU-301, LBG 402, Tulsi (LBG-787)	IPU 2-43, WBU-108, KU-301, Tulsi (LBG-787)	Tulsi (LBG-787)
M.P. & C.G.	Pant Urd-30, JU-3, KU 96-3, TPU-4, JU-2, Khargone-3	Pant Urd 31	Pant Urd 31
Maharashtra	KU 96-3, TPU 4, AKU-4 (Melghat), AKU-15	-	-
Odisha	IPU 02-43, WBU-108, KU 301	B-3-8-8, OBG-17, Mash 338	B 3-8-8, OBG 17, Mash 338
Punjab	WBU 108, IPU 94-1 (Uttara), Mash 338, Mash 414	-	KU 300 (Shekhar 2), KUG 479
Rajasthan	Pant Urd-31, WBU 108, IPU 94-1 (Uttara)	-	KU 300 (Shekhar 2), KUG 479
U.P. & Uttarakhand	Pant Urd-40, WBU-108, IPU 94-1 (Uttara)	-	KU 300, WBU 109, KU 91 (Azad Urd 2) KUG-479, Narendra Urd 1
Tamil Nadu	IPU 02-43, Vamban-4, Vamban-7, Tulsi (LBG-787)	Vamban-3, TU 94-2, Tulsi (LBG-787)	Vamban 3, TU 94-2, Vamban 5, Vamban 2, Tulsi (LBG-787)
West Bengal	Pant Urd 31, WBU 108, IPU 94-1 (Uttara)	Pant Urd-31, WBU-190, KU-92-1 (Azad Urd-1)	Pant Urd 31, WBU 109, KU 91-2 (AZAD Urd 1)

Source: Seednet GOI, Min. of Agri. & FW, & ICAR-IIPR, Kanpur

Climate Requirement

Being a crop of tropical region, it requires hot and humid climate for best growth. It is basically a warm weather crop. In North parts of the country where the temperatures during winter are quite low, it is cultivated generally during rainy and summer season. In the Eastern states, it is also grown during winter. In Central and Southern states, where there is not much variation in the climate, it is cultivated during winter and rainy seasons

Soil & Field Preparation

Black gram can be grown on variety of soils ranging from sandy soils to heavy cotton soils. The most ideal soil is a well drained loam with pH of 6.5 to 7.8. Black gram cannot be grown on alkaline and saline soils. Land is prepared like any other kharif season pulse crop. However during summer it requires a thorough preparation to give a pulverized free from stubbles and weeds completely.

Sowing Time & Method

Kharif : In kharif season sowing is done with the onset of monsoon in later part of June or early part of July.

Rabi : Second fortnight of October (upland) second fortnight of November (Rice fallow)

Summer : The sowing could be done from the third week of February to first week of April. Sowing should be done in furrows opened at a distance of 20-25 cm, seed drill could be used for this purpose.

Seed Rate & Spacing

i) **Kharif** : During kharif season 12-15 kg seed/ha. The crop should be sown at a distance of 30-45 cm with 10 cm plant spacing.

ii) **Rabi** : About 18-20 kg seed/ha for upland and 40 kg/ha for Rice fallows with a crop geometry of 30 cm x 15 cm. Higher seed rate in rice fallow is used due to delayed in sowing.

iii) **Summer** : About 20-25 kg seed is required per ha. Plant to plant spacing should be kept at 5-8 cm depending upon sowing time and varietal behaviour.

Seed Treatment

Treat the seed with Thiram (2g) + Carbendazim (1g) or Carbendazim @2.5 g/kg seed to control the soil & seed germinated disease. For sucking pest control seed treatment with Imidacloprid 70 WS @ 7g/ kg seed . It is also desirable to treat the seed with *Rhizobium* & PSB culture (5-7 g/kg seed).

Fertilizer

For sole crop 15-20 kg/ha Nitrogen, 40-50 kg/ha Phosphorus, 30-40 kg/ha Potash, 20 kg/ha Sulphur is should be applied at the time of last ploughing. However phosphatic and potassic fertilizer should be applied as per soil test value. Fertilizer should be applied by drilling either at the time of sowing or just before sowing in such a way that they are placed about 5-7 cm below the seed. Use of gypsum @ 100 kg/ha would ensures availability of calcium and sulphur at economical rates.

Water Management

In kharif season irrigation not required, if rainfall is normal & if moisture deficit at pod formation stage irrigation should apply. In summer 3-4 irrigation required according to crop requirement. Generally, the crop should get irrigation at an interval of 10-15 days. From flowering to pod development stage, there is need of sufficient moisture in the field.

Weed Control

One or two hand weedings should be done up to 40 days of sowing depending upon the weed intensity. Weeds can be controlled by the use of chemicals too. Use Pendimethalin 30% EC @ 0.75-1.00 kg a.i. per ha in 400-600 liters of water as pre-emergence application.

Plant Protection Measures

There are several important disease of Urdbean, Yellow mosaic virus, Powdery mildew, leaf blight etc. are important one.

Diseases

Yellow Mosaic Virus

Symptoms

This disease is caused by the mung bean yellow mosaic virus (MYMV) belonging to Gemini group of viruses, which is transmitted by the whitefly (*Bemisia tabaci*). The tender leaves show yellow mosaic spots, which increase with time leading to complete yellowing. Yellowing leads to less flowering and pod development. Early infection often leads to death of plants.



Control Measures

i) Diseased plants should be rogued out to prevent further spread of the disease; ii) In order to prevent whitefly (*Bemisia spp.*) infestation spray with triazophos 40 EC @ 2.0 ml/lit. or malathion 50 EC @ 2.0 ml/lit. or oxydemeton methyl 25 EC @ 2.0 ml/lit. at 10-15 days intervals if required; iii) Grow tolerant/resistant varieties like IPU 94-1 (Uttara), shekhar 3(KU 309), Ujala(OBJ 17), VBN(Bg) 7, Pratap urd 1 etc.

Powdery Mildew

Symptoms

The disease appears on all the part of plants above soil surface. Disease initiates as faint dark spots, which develop into small white powdery spots, coalescing to form white powdery coating on leaves, stems and pods. At the advance stages, the color of the powdery mass turns dirty white. The disease induces forced maturity of the infected plant causing heavy yield losses and its intensity increases in stress condition.



Control Measures

i) Adopt clean cultivation by destroying diseased plant refuge; ii) Delayed sowing of mungbean and urdbean with wider spacings considerably reduce the disease severity; iii) Opt for resistant varieties as per recommendation of local agricultural authorities Urdbean: COBG10, LBG 648, 17, Prabha, IPU 02-43, AKU 15 and UG 301); iv) Spray with NSKE @ 50 g/liter of water or neem oil 3000 ppm @ 20 ml/lit. twice at 10 days interval from initial disease appearance. Spray with eucalyptus leaf extract 10% at initiation of the disease and 10 days later also if necessary; v) Spray with water soluble sulphur 80 WP @ 4 kg/liter or Carbendazim 50 WP @ 1 g/lit.

Leaf Blight

Symptoms: In pre-emergence stage, the fungus causes seed rot and mortality of germinating seedlings. In post emergence stage, seedling blight disease appears due to soil or seed-borne infection. The fungus attacks the stem at ground level, forming localized dark brown patches which coalesce and encircle the stem. Black dot like sclerotia are formed on the surface and below the epidermis on the outer tissue of the stem and root. The pathogen is most favoured at a temperature of 30°C and 15% moisture.



Control Measures

i) Basal application of zinc sulphate @ 25kg/ha or neem cake @ 150 kg/ha or soil application *P. fluorescens* or *T. viride* @ 2.5 kg/ha + 50 kg of well decomposed FYM at the time of sowing helps in prevention

of the disease; ii) The diseased plants should be uprooted and destroyed so that the sclerotia do not form or survive; iii) Spray with Carbendazim 50 WP @ 1 g/liter of water at an interval of 15 days with the appearance of the symptoms.

Insect-Pest Management

Aphids

Nature of Damage: Nymphs and adults are seen in large numbers on young plants, leaflets, stem and pods. Young leaves of seedlings become twisted. Excretion of honey dew attracts sooty mold. The adults are black and shiny, upto 2 mm long and some are winged. Nymphs are covered with waxy coating that makes them grey and dull.



Control Measures

i) Spray with 5% crude neem extract or 2% neem oil 3000 ppm; ii) Spray with Dimethoate 30 EC (1.7 ml/ lit.) or Imidacloprid 17.8 SL @ 0.2 ml/liter of water ; iii) Conserve coccinellid beetles, their grubs and Chrysoperla.

Tobacco Caterpillar

Nature of damage: Newly hatched tobacco caterpillar (*Spodoptera litura*) feed gregariously on the leaf surface for about 2-3 days and leave behind the whitish membranous leaf only. The larvae makes irregular holes on the leaf surface and in severe infestation, they skeletonize the foliage. They are voracious feeders of the foliage and remain hidden in cracks and crevices or plant debris in the soil during day time. The maximum damage is caused to the young plants, which are often totally destroyed



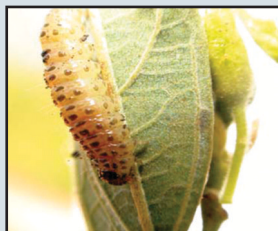
Control Measures

i) Collection and destruction of egg masses and newly hatched larvae along with skeletonized leaves can reduce infestation; ii) Spray of microbial pesticides like SINV [500 LE/ha or or *Bacillus thuringiensis* formulations in synchrony with early larval instars is effective against the pest; iii) Spray Malathion 50 EC @ 2.0 ml/lit. or

foliar application of Novaluron 10 EC @ 0.75 ml/lit., chitin synthesis inhibitor against eggs of *S. litura*; iv) Spray extract of custard apple as feeding deterrent against the pest.

Spotted Pod Borer

Nature of Damage: The larva webs the leaves, inflorescence and feed inside the flowers, flower buds and pods. Eggs are laid on or in the flowers (inserted between the petals). Young larvae feed inside the flowers before moving to developing pods when mid-sized. A larva may consume 4-6 flowers before larval development is completed. Third to fifth instar larvae are capable of boring into the pods and feeding the developing grains. Seeds in damaged pods are totally or partially eaten out by larvae.



Control Measures

i) Spray *Bacillus thuringiensis* 5 WG @ 1.0 g/liter of water; ii) foliar spray of Profenofos 50 EC @ 2.0 ml/liter of water; iii) Spray of spinosad 45 SC @ 0.2 ml/liter of water is most effective in controlling this pest; iv) Physical shaking of the infested plants over the vessels of oil and water or oily cloth help reduce the population.

Harvesting, Threshing & Storage

Urd should be harvested when 70-80 % pods matured & most of the pods turn black. Over maturity may result in shattering. Harvested crop should be dried on threshing floor for few days and then threshed. Threshing can be done either manually or by trampling under the feet of bullocks. The clean seeds should be sun dried for 3-4 days to bring their moisture content at 8-10% to safely store in appropriate bins.

Yield

A well managed crop of Urd may produce 12-15 quintals grains/ha.

Recommendation to achieved higher production

- i) Deep summer ploughing once in 3 years.
 - ii) Seed treatment should be done before sowing.
 - iii) Application of fertilizer should be based on soil test value.
 - iv) In kharif season sowing should be done by ridge & furrow method.
 - v) Yellow mosaic resistant/ tolerant varieties IPU 94-1 (Uttara), shekhar 3(KU 309), Ujala(OBJ 17), VBN(Bg) 7, Pratap urd 1 etc choose as per suitability of region.
 - vi) Weed control should be done at right time.
 - vii) Adopt integrated approach for plant protection.
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- For technical information of crop production please contact to district KVK/ nearest KVK.
 - To avail benefit from Central and State Government running schemes for crop production (ploughing, fertilizers, micronutrient, pesticide, irrigation equipment), agricultural implements, storage infrastructure etc., please contact to your DDA/SADO office.

**- For more information also visit -
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