

ARHAR

Arhar is hardy crop and requires very little investment. It was grown on 4.6 thousand hectares and the total production was 4.4 thousand tonnes during 2009-2010. It gave an average yield of 910 kg/ha (364 Kg per acre).

Soil Type :

Arhar grows well on a wide range of soils. It does best on fertile and well drained loamy soils. The saline-alkaline or waterlogged soils are unfit for its cultivation.

Rotations :

Arhar-Wheat/Barley Arhar-Sufed Senji-Sugarcane

Improved Varieties :

PAU 881 (2007) : It is an early maturing variety with indeterminate growth habit. It matures in about 132 days and vacates the field well in time to sow the succeeding wheat crop. Its plants are about 2 meter tall. Pod formation is profuse and each pod contains about 3-5 yellow brown and medium sized seeds. Its average grain yield is 5.6 q/acre.

AL 201 (1993) : It is an early maturing variety with indeterminate growth habit. It matures in about 140 days and vacates the field by the end of October permitting timely sowing of the succeeding wheat crop. The plants are erect and about 2.5 metre tall. The main stem is much longer than the side branches and its flower is yellow with prominent red streaks on the standard petal. Pod formation is profuse and each pod contains 3-5 yellowish brown and medium sized seeds. The average grain yield is about 6.2 q per acre.

AL 15 (1981) : It is a short duration variety with determinate growth habit. This variety matures in about 135 days and vacates the field by the end of October permitting timely sowing of the succeeding wheat crop. The plants are compact and short-statured attaining a height of about 1.5 to 1.8 metre. Pods are borne in clusters at the top of the plant and maturity is relatively synchronous. Podding is profuse and each pod contains 3-5 yellowish brown and medium sized seed. It gives an average yield of 5.5 q per acre.

Agronomic Practices :

Land Preparation : Prepare the land well to free it from clods and weeds. Planking should follow each ploughing.

Seed Rate : Use 6 kg of seed per acre.

Seed Treatment : Treat the seed with Captan or Thiram @ 3 g per kg of seed, against seedrot and seedling-blight.

Time and Method of Sowing : Sow the crop in the first fortnight of June so that succeeding crop can be sown with the least delay. The row spacing of 50 cm and the plant spacings of 25 cm are recommended for all the varieties. Timely sowing and the maintenance of optimum plant population are essential for obtaining a good yield.

Zero tillage : *Arhar* can also be sown without any tillage operation with zero till drill after conventional or zero till sown wheat without any adverse effect on yield. If field is infested with weeds, these can be controlled by spraying half litre of Gramoxone (paraquat) in 200 litres of water before sowing.

Intercropping : Short duration varieties of *moong* namely, ML 613 and ML 267 can be successfully grown between the rows of *arhar*. It will yield about 1.2 quintal of grain per acre without reducing the yield of *arhar*.

Fertilizer Application :

The following doses are recommended:

*Nutrient (kg/acre)						Fertilizer (kg/acre)
N	P ₂ O ₅	**K ₂ O	Urea (46%N)	***DAP or (18% N 46% P ₂ O ₅)	Super Phosphate (16% P ₂ O ₅)	Muriate of potash (60% K ₂ O)
6	16	12	13	35	100	20

* These nutrients can also be supplied from other fertilizers available in the market (Appendix IV).

** Apply only when the soil test shows deficiency of potash.

*** Where DAP is used, omit nitrogen application. Drill all fertilizers at sowing.

Note : In *arhar*-wheat rotation, if *arhar* follows wheat, which received recommended dose of P, omit its application to *arhar*.

Weed Control : Two hoeings may be given, one about three weeks and the other about six weeks after sowing. Weeds can also be controlled by applying Stomp 30 EC (pendimethalin) @ 1 litre/acre or Stomp 30 EC (pendimethalin) @ 600 ml/acre followed by hand weeding six to seven weeks after sowing. Stomp should be sprayed as pre-emergence i.e. within two days of sowing of the crop using 150-200 litres of water per acre.

Irrigation : Apply the first irrigation 3 to 4 weeks after sowing. Further irrigation may be given only if the rains fail. After mid-September, do not apply irrigation otherwise the maturity of the crop will be delayed.

Harvesting :

Crop ripens by the end of October when sown in the first fortnight of June.

Plant-Protection Measures

Insect Pests

Pod borer : Pod borers especially Gram pod borer (*Helicoverpa armigera*) are the most important insect pests of *arhar*. The larvae of these borers are of different sizes and colours. They feed on leaves, flower buds, flowers, pods and seeds in pods, thus causing heavy loss in grain yield. Larval presence can be confirmed from damage to plant parts and from dark-green faeces below the plants on the soil. Spray the crop on the appearance of larvae at pod initiation/podding stage with one litre Thiodan 35 EC (endosulfan) in 100-125 litres of water per acre using manually operated knapsack sprayer. Repeat the spray after 10 days, if necessary.

Precautions : Because honey bees and other pollinators may be killed by the use of above insecticides it is, therefore, advised to spray the crop during evening as the population of these pollinators is minimum at that time.

B. Diseases

1. Cercospora leaf spot : Leaf spots are caused by *Cercospora cajani*. Greyish brown to dark spots are produced on the under surface of the leaf. Often several spots coalesce to form irregular blotches. Sometimes lesions occur on petioles and stems. Infection causes premature defoliation of leaves. Use disease free seed to reduce the infection. Treat the seed with Captan or Thiram @ 3g per kg seed.

2. Bacterial leaf spot—This disease is caused by *Xanthomonas campestris pv. cajani*. Angular dark-brown spots appear on the leaf surface and usually concentrated on one side of the mid-rib. Spots may develop on vein, petioles, main stems and branches. Use disease free seed to reduce infection.

3. Phytophthora stem blight : It is caused by *Phytophthora drechslera f.sp. cajani*. The disease affects young seedlings as soon as they emerge and get killed. On stem, brown to black necrotic lesions are produced, which have definite margin and slightly depressed. In some cases stem swollen into a cankerous structure at the edge of the lesion which may break at the lesions site. The leaflet lesions are circular to irregular in shape and whole foliage can become blighted. Avoid sowing *arhar* in soil with poor drainage and follow rotation in badly infested fields.

4. Sterility mosaic : The causal agent of sterility mosaic is transmitted by an eriophyid mite (*Aceria cajani*). Typical symptoms are mild mosaic and either no or little flowering and pale green colour of the leaves. The leaves are crowded and auxiliary buds give rise to bushy growth.

Control : *Arhar* and some of its wild relatives such as *Cajanus platycarpa* are the only Recorded hosts. Destroy wild species and do not allow any *arhar* plant standing around the sugarcane, cotton and other fields during winter season in order to check the primary source of infection.