JUST AGRICULTURE
multidisciplinary e-Newsletter

Successful Cultivation of *Kharif* Moong and Mash for Sustainability of Agriculture in Kandi Region of Punjab

Mandeep Pathania and Vijay Kumar
PAU, Regional Research Station, Ballowal Saunkhri, Punjab-144521

ARTICLE ID: 79

Pulses belongs to the family of legumes and the term "pulse" refers only to the dried seed of these plants. Pulses are the crops that can help both agriculture and the food industry as they reduce greenhouse gas emissions, enrich soil health and use less water than other crops. Being leguminous crops, they fix atmospheric nitrogen into the soil thus less/ no nitrogen fertilizers are required, play important role in crop rotation, suits best for mixed and intercropping systems and can be promoted to break the paddy-wheat crop rotation system of Punjab agriculture. Besides this they serve as a low-cost protein to meet the needs of a large section of people. Pulses are high in fiber, have low fat, no/zero cholesterol, high protein, low glycemic index and high nutrient foods. India is the largest producer, consumer and importer of the pulses in the world. During 2021-22, the acreage, production and productivity under moong and mash in Punjab are 2.1 thousand hectare, 2000 tonnes, 9.38q/ha and 1.6 thousand hectares, 700 tonnes and 4.41q/ha, respectively. Pulses can be grown on all types of soil and climatic conditions, however, in India pulse cultivation is least prioritized and are generally taken either as rainfed or on marginal lands. In many parts of Punjab also, pulses are grown under rainfed or limited availability of water or as a filler crop.

Keeping in view the present scenario of rising prices of pulses, their health benefits to humans and to break the paddy-wheat crop rotation system to save the ground water of Punjab, stakeholders and farmers should focus on the cultivation of these short duration high value crops. Cost of cultivation as well as water requirement of pulses is quite low, as compared to other crops. So, promoting pulse crops can help us to overcome nutritional insecurity, improve soil fertility and provide good income support to farmers. One can harvest better yield of these pulses by adopting the PAU recommended production technologies:

Plough the fields before the onset of monsoon rains (summer ploughing) for *in situ* moisture conservation and also to kill the weed seed as well as insect-pest larvae in the soil.

JUST AGRICULTURE
multidisciplinary e-Newsletter

Plough the fields two to three times followed by planking to crush the clods and eradicate the weeds, immediately after the first monsoonal rains.

Recommended varieties:

Improved varieties recommended by Punjab Agricultural University viz. ML 1808, ML 2056 and ML 818 of moong and Mash 883, Mash 114 and Mash 338 of mash are recommended for cultivation in Punjab region.

Seed rate and treatment:

Use 8 kg seed of moong and 6-8 kg of mash per acre to achieve good plant stand in the field. Seed inoculation with PAU *rhizobium* culture at the time of sowing helps in increasing the grain yield by 12-16 per cent in moong crop. For inoculation, wet the seed recommended for one acre, in minimum amount of water and mix one packet of *Rhizobium* culture thoroughly with the seed on a *pucca* floor and dry it in shade. The culture is available at PAU Seed Shop at Gate No. 1, Krishi Vigyan Kendras and Farm Advisory Service Centres in different districts. The culture of *Rhizobium* and fungicide can be applied simultaneously.

Time and method of sowing:

Sowing of both the crops should be done with the onset of monsoon upto /last week of July. The sowing should be done in 30 cm apart rows using kera/pora method to place the seed at a depth of 4-6 cm.

Weed control:

Weeds must be controlled at appropriate time to get higher yield. In moong, weeds can be controlled with one or two hoeing's. Give first hoeing after four weeks and second after six weeks of sowing. In mash, hoe the crop one month after sowing.

Fertilizer application:

Fertilizers should be applied on soil test basis for its optimum use, however, for soils with medium fertility apply 11 kg urea and 100 kg single superphosphate in case of moong and 11 kg urea and 60 kg single superphosphate per acre in case mash should be applied at the time of sowing.

Management of major Insect-pest and diseases:

Insects:

kharif season moong and mash are mainly attacked by green jassid, whitefly, aphids, blister beetle, hairy caterpillar, pod borers and mite.

JUST AGRICULTURE
multidisciplinary e-Newsletter

Whitefly, Jassid and aphids:

Nymphs and adults of whitefly and aphid suck sap from the leaves, thus lowering the vitality of the plants. Whitefly excretes honeydew on which sooty mould develops, resulting in blackening of leaves which hinders photosynthesis. In case of severe attack, there is total blackening of the crop, resulting in drying of leaves and ultimately total crop failure. Whitefly also vectors of mungbean yellow mosaic virus. Jassid nymphs and adults suck sap from the leaves resulting in yellowing and drying of leaves. To check the incidence of these insects, spray the crop with 1 litre of homemade neem extract using 80-100 litres of water per acre with manually operated knapsack sprayer. To prepare neem extract farmers are advised to boil 5 kg of neem leaves and fruits in 10 litres of water for 30 minutes and filter this material through muslin cloth. The filtrate thus collected should be used for spraying. Repeat the spray after one week, if necessary.

Hairy Caterpillar:

The caterpillar feeds gregariously on the green matter of leaves, leaving behind only the midribs on few plants in scattered spots. The young caterpillars can be destroyed by pulling out the infested plants and burying them underground while, grown-up caterpillars can be destroyed by crushing them under feet or by picking and putting them into kerosenized water. In case of heavy incidence, spray the crop by using 500 ml of Ekalux 25 EC (quinalphos) in 80-100 litres of water per acre with a manually operated knapsack sprayer.

Blister beetle:

Adults of beetles are robust with bright black stripes on the forewing and cause major damage by feeding on tender buds and flowers at the flowering stage. The adults can be collected manually and killed at the beginning of the incidence.

Mite:

Mites feed on the underside of leaves by scrapping the leaf surface and the infestation is visible as webbing on underside of leaves which turns pale later on. Such leaves then turn light brownish to dark reddish brown.

Diseases:

The major diseases interfering with the production of pulses are as follows:

Yellow mosaic virus:

JUST AGRICULTURE
multidisciplinary e-Newsletter

This viral disease is transmitted by whitefly and is more severe on moong. The leaves of the diseased plants develop irregular yellow and green patches. Farmers are advised to rogue out the affected plants early in the season. Grow yellow mosaic virus tolerant varieties of *moong* (ML 1808, ML 2056 and ML 818) and mash (Mash 883, Mash 114 and Mash 338) recommended by PAU, Ludhiana.

Cercospora leaf spot:

The fungi produce circular and necrotic brown spots on leaves, which coalesce to cover whole leaf area and resulted in defoliation. The disease development is favoured by intermittent rains. Grow disease resistant varieties of *moong* (ML 1808, ML 2056 and ML 818) and mash (Mash 883, Mash 114 and Mash 338).

Harvesting and threshing:

Harvest both the crops when the leaves fall off and most of the pods are mature. Do not uproot the plants. Make the bundles of the crop and on complete drying, thresh it on pucca floor. Store the crop in clean and dry container.