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Short Duration Mungbean: A Pulse with Promise to Improve the Livelihood Status of Farmers in Punjab

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Introduction

Pulses are an important source of protein for almost all of the peoples of country as many of them are dependent on cereals and pulses for their daily requirement. Among several pulses grown throughout the country, Mungbean (*Vigna radiata*) is an important vegetable legume due to its high protein content (24%) and easily digestible nature which constitutes a balanced diet coupled with cereals. Mungbean contains vitamin A (94 mg), iron (7.3mg), calcium (124 mg), zinc (3 mg) and folate (549 mg) per 100 g dry seed (Calloway et al., 1994). It is mainly consumed as "*dhal*" throughout the country and some other food products made from mungbean such as fried snacks and sprouts are also consumed at a larger scale. It is also grown as a green manure crop by farmers to improve the soil fertility. Despite the immense importance and uses, mungbean did not get the status of a commercial crop as it is grown only on marginal or fallow land. As a result of the Green Revolution, the rice-wheat croppingsystem now dominates the important food production areas of the Punjab.These two staple grains have replaced more than 25 different crops in both the *Kharif* (rainy) and *Rabi* (summer) growing seasons. This system provides good returns to farmers and strengthens food security, but sustainability is declining due to the lack of any adjustment in crop rotation although options for such adjustment exist.

Due to continuous cultivation of cereals in intensively cropped areas, nutrient (NPK) uptake increased by 663 kg compared the applied 400 kg/ha to yield 8.8 t/ha in rice-wheat rotation, and 438 kg against the applied 358 kg/ha to yield 6.3 t/ha in rice-rice rotation (Ali and Kumar, 2004). To get the maximum yields from rice-wheat cropping systems, the farmers had shifted their focus from organic fertilizers to inorganic fertilizers. Planting of rice, two months before the onset of the monsoon has dangerously lowered the water table at the rate of 300 mm per year. Excessive and indiscriminate use of irrigation water causes

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salinity to increase and water to stagnate in part of the Punjab. After the harvest of wheat and before the transplanting of rice, the land remains fallow for 65-70 days (late March/April to early July). This period could be used to raise a catch crop of summer mungbean. A low input, short duration, high value crop, mungbean fits very well into rice-wheat cropping systems and other crop rotations (Shanmugasundaram, 2006). Mungbean fixes nitrogen in the soil, requires less irrigation than many field crops to produce a good yield, and helps maintain soil fertility and texture. Adding mungbean to the cereal cropping system has the potential to increase farm income, improve human health and soil productivity, save irrigation water, and promote long-term sustainability of agriculture.

Farmers double area under mungbean after MSP assurance

On the assurance of Punjab's CM Bhagwant Mann for providing the MSP on mungbean crop, the state farmers have responded by doubling the area under its cultivation this year. With the MSP on mungbean fetching Rs 7275 per quintal, the initiative will help supplement farmer's income by sowing another crop between wheat-paddy cycle. As per the Agriculture Department data, after the assurance of MSP, the area under cultivation of mungbean has been increased throughout the different districts of the state.

Compositions of mung bean			
Nutrients		**Nutrient Value**	**% Daily Value**
Total Fat		1.2 g	1 %
	Saturated fat	0.3 g	1 %
Cholesterol		0.0 g	0 %
Sodium		15 mg	0 %
Potassium		1246 mg	35 %
Total Carbohydrate		63 g	21 %
	Dietary fiber	16 g	64 %
	Sugar	7 g	
Protein		24 g	48 %
Vitamin C			8 %
Vitamin D			0 %
Vitamin B6			20 %

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Iron			37 %
Magnesium			47 %
Calcium			13 %
Cobalamin			0 %
Calories		347 Kcal	17 %

General cultural practices for mungbean under Punjab

- **Soil Type:** A well-drained loamy to sandy loam soil is best suited to the crop. Soils that are saline-alkaline or wet are not recommended for the crop.
- **Rotations:** Summer Mungbean-*Kharif* Mungbean-Raya/Wheat, Mungbean-Potato/Peas-Spring Groundnut and Mungbean-Potato/Peas-Spring Groundnut

Improved Varieties of mungbean:

- **ML 1808 (2021):** Its plants are tall and medium-sized (71 cm). Pods are abundant and each pod bears 11-12 seeds. This variety resistance to mungbean yellow mosaic virus, cercospora leaf spot, and bacterial leaf spot. It takes around 71 days to mature. The grains are bright green and fairly robust in flavour with excellent cooking qualities. The average grain yield is 4.8 quintals per acre.
- **ML 2056 (2016):** It has tall and medium-sized plants (78 cm). Pods are abundant, with 11-12 seeds in each pod. It is tolerant to Mungbean yellow mosaic virus, cercospora leaf spot, and bacterial leaf spot. It takes around 71 days to reach full maturity. The grains are bright green in colour and have a medium robust flavour. About 4.6 quintals per acre is the average grain yield.
- **ML 818 (2003):** It has tall and medium-sized plants (75 cm). There are 10-11 seeds in each pod. Mungbean yellow mosaic virus, cercospora leaf spot, and bacterial leaf spot tolerance are all evident. It takes 72 days for it to reach full maturity. It produces around 4.2 quintals of grain per acre on average. It has medium robust grains that are bright green in colour and have good cooking qualities.

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Agronomic practices:

- **Land preparation:** To break the clods and remove the weeds, plough the field 2-3 times followed by planking. With a zero till drill, mungbean may be sowed without any prior tillage.
- **Time of sowing and seed rate:** The sowing should be done at second fortnight of July. The seed rate for mungbean is 8 kg per acre.
- **Seed Inoculation:** At the time of planting, inoculate the mungbean seed with the Rhizobium culture. Wet the seed for one acre using the least quantity of water possible. On a clean pucca floor, thoroughly mix one packet of Rhizobium with it and let it dry in the shade. Sow the seed instantly. Grain yield is increased by 12-16% when seed is inoculated with culture. Rhizobium and fungicide can both be used at the same time.
- **Method of Sowing:** Sowing should be done at 30 cm row spacing. Plants should be spaced around 10 cm apart, and seeds should be sown 4 to 6 cm deep using a seed drill/pora/kera. Adopt the bi-directional technique of sowing, which involves planting the crop in both directions at 30 cm row spacing with half the seed rate in each

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direction. Mungbean may be seeded in a zero till drill without any seed bed preparation.

- **Weed Control:** Give the 2-3 hoeing for weed control i.e. first hoeing 4 weeks after sowing of the crop and second hoeing, if needed, about 2 weeks thereafter.
- **Irrigation:** Irrigation is required for the kharif season crop if the rain fails.
- **Fertilizer Application:** Drill 5 kg of N (11 kg of Urea) and 16 kg of P_2O_5 (100 kg of single superphosphate) per acre at sowing.
- **Harvesting and Threshing:** When 80 per cent of the pods have matured, the crop should be picked. Sickle is used to harvest the crop. Plants must not be uprooted. After making the necessary adjustments, a spike tooth type power thresher for wheat may be used to thresh mungbean. Gramoxone (paraquat) @ 800 ml per acre can be sprayed with 150-200 litres of water after around 80% of the pods have matured to dry the crop leaves for combine harvesting.

Conclusion

Mungbean is a crop of economic importance which can play a major role in fulfilment of the protein requirement of a large number of populations and also can help in increasing the farmer's income. It is generally cultivated on sandy loam soil and in rotation with several other crops. The improved varieties such as ML 1808, ML2056 and ML818 developed by PAU, Ludhiana gives higher yields to get higher outturn. In the coming years, it can become a crop of high importance for the general population as well as for farmers owing to its widespread uses for humans.

References

Ali, M. and Kumar, S. 2004.Prospects of mungbean in rice-wheat cropping systems in Indo-Gangetic Plains of India. In: Proceedings ofthe Final Workshop and Planning Meeting. Improving Income andNutrition by Incorporating Mungbean in Cereal Fallows in the Indo- Gangetic Plains of South Asia, S. Shanmugasundaram (ed.). DFIDMungbean Project for 2002–2004, 27–31 May 2004, Ludhiana, Punjab,India, pp. 246-254.

Calloway, D.H., Murphy, S.P. and Bunch, S. 1994. User's guide to the international minilist nutrient database.Department of Nutritional Sciences, University of California, Berkeley, CA.

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Shanmugasundaram, S. 2006. Improving income and nutrition by incorporating mungbean in cereal fallows in the Indo-GangeticPlains of South Asia.Proceedings of the Final Workshop. AVRDC Publication No. 06-682, AVRDC - The World Vegetable Center, Shanhua, Taiwan.p. 342.