

Production Technology of Knol Khol (*Brassica oleracea* var. *gongylodes*) under Sub-Tropics of Jammu

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Introduction

It is one of the important cole crops of Jammu and Kashmir union territory and is cultivated on acreage of about 2712 hectares with production of 55118MT in Jammu province (Anonymous, 2017). Knol khol is known by many names in J&K such as Kholrabi, Kadam and Gaanth Gobhi. It is an annual vegetable and belongs to the family Cruciferae and genus '*Brassica*'. Enlargement of the stem is fleshy edible portion, commonly known as knob that develops entirely above the ground. Both the green leaves and knobs are used as culinary at tender age and when the knobs become fibrous used for pickle purpose.

Importance

Knol khol contains protein 1.10 g, calcium 20 mg and other minerals 0.70 mg per 100 g of edible portion (Cosicet *al.*, 2013). Besides the vegetable contains many B-complex vitamins and helps in fighting cancer as well as asthma and lung problems. It promotes healthy digestion, boosts the immunity system. The vegetable stabilizes blood pressure and aids in weight loss. The popularity and acceptability of knol khol has increased over a period of time across Jammu region due to the presence of glucosinolate compound which has strong anti-carcinogenic properties.

Climate and Soil

This is a cool season crop and thrives well in a relatively cool moist climate. It is grown mainly as a winter crop in sub-tropical plains and the specialty of the vegetable is that it can withstand extreme cold as well as frost conditions better than other winter season crops. Knol khol seeds germinate well at 15 to 32°C temperature. It can be grown on wide range of soils and require soil pH ranges from 5.5 to 7. For early crop, sandy or sandy loam soils whereas for late crop, clay loam and silty loam soils are preferred.

Varieties

There are two kinds of varieties are available in market; one is early grown and the other is late variety. In Jammu region of Union territory of Jammu and Kashmir, the important promising varieties grown are G-40, Purple Vienna, White Vienna, King of Market.

Seed rate

Nursery of knol khol crop raised to produce seedlings to be transplanted in an area of 1 ha using a seed rate of 1 kg/ha.

Sowing time

Being short duration and high value cash crop, 3-4 crops of knol khol can be taken by farmers to augment their income. Time frame of sowing of seeds varies for different cultivars. It can be grown round the year under sub-tropical condition of Jammu as shown in Table 1.

Table 1: Recommended sowing and transplanting time for knol khol crop under sub-tropical condition of Jammu

Number of crops	Sowing time	Transplanting time
First crop	Mid September	Mid October
Second crop	Mid October	2 nd week of December
Third crop	Mid February	Last week of March
Fourth crop	Last week of March	Mid April
Fifth crop	Last week of August	Direct sowing

(Source: Directorate of Extension, SKUAST-Jammu, 2020)

Preparation of nursery beds

Raised beds of dimensions of 3 m × 1 m × 0.15 m (length × width × height) are prepared by mixing well rotten FYM in soil @ 15 kg/m². The seeds sown in lines at the depth of 3 cm. After sowing, the seed beds were covered with a fine mixture of soil and FYM and further the seed beds are covered with paddy straw mulch. The seeds germinate in 6-9 days after sowing. In the beginning, regularly light watering is done with the help of rose can but slowly the frequency of watering reduces.

Field preparation

The plots are prepared manually to obtain good tilth with the help of spade. The recommended dose of FYM applied during land preparation or mixed well with the soil

where as full dose of nitrogen, phosphorus and potash should be applied at the time of transplanting (dose given in Table 2). Thereafter planking was done manually with the help of wooden plank to conserve the moisture.

Table 2: Recommended dose of fertilizer for knol khol crop

N (kg/ha)	P ₂ O ₅ (kg/ha)	K ₂ O (kg/ha)	FYM (t/ha)
100	50	50	30
Urea (kg/ha)	DAP (kg/ha)	MOP (kg/ha)	
175	109	84	



Figure 1: a) Nursery raising of knol khol seedlings and b) Harvesting of Knol Khol Transplanting

About 30 days old uniform growth seedlings are transplanted in the plots. Before, taking out of the seedlings, seedbeds are watered thoroughly so that seedlings may come up with the entire root system. Transplanting was done manually with the help of khurpi at spacing of 30 cm × 20 cm or 30 cm × 30 cm and make sure to press the soil around the seedling for the better root establishment. Light irrigation must be given immediately after transplanting for the better survival of seedlings.

Gap filling

To maintain uniform population, gap filling should be done within week after transplanting.

Irrigation

It requires continuous supply of moisture for uniform growth and development of knobs. Subsequent irrigations given to the crop at an interval of 7 to 8 days.

Intercultural operation

Weed management is cardinal operation for obtaining higher yield. First weeding and hoeing should be carried out at 20 days after transplanting and later on at 10 days interval done.

Plant protection measures

Imidacloprid 17.8% SL @ 170 ml/ha sprayed on 15th day after transplanting to protect knol khol from insect and pest attack.

Harvesting

The knobs are harvested by cutting manually with the aid of sickle or sharp knife when the swollen stem appeared to be soft and non-fibrous in nature. Tender leaves along with knob cut close to the ground and the dead leaves must be removed to increase the market value.

Conclusion

Based on two years research study and adoption of appropriate production technology, knol khol variety G-40 adjudged the most remunerative and profitable when seedlings were transplanted in mid October under irrigated sub-tropics of Jammu.

References

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