

Kharif onion cultivation – a boon for the farmers of Northern India

The stored stock of *rabi* onion exhausts after November resulting in a critical gap in supply during November-January in North India. Therefore, we need to import onion from south India and other countries due to which price increases. The price of onion in North India goes up to ₹ 100-120 per kg during this period. So, if the farmers of North India go for cultivation of *kharif* onion, they will not only improve their livelihood by increasing their income but also contribute in steady supply of onion at reasonable price. *Kharif* onion production through setts must be popularized on a large scale to the farmers. In this technique, setts are produced in March-May and stored up to August. In the second fortnight of August, these setts are replanted in the fields which can be harvested from October to December as green or fully developed bulbs.

ONION is an important commercial crop of our country and it is one of the oldest cultivated vegetable. It has originated in central Asia and is extensively cultivated all over the world, especially in China, India, The Netherlands, Pakistan, Bangladesh and Australia. India is the second largest producer of onion with an area of 1293 thousand ha and production of 21718 thousand MT. In India, Maharashtra is the largest producer of onion with about 471.66 thousand ha area and 6773.08 thousand MT of production with 22.05 t/ha productivity. In Himachal Pradesh, area and production of onion is around 2.56 thousand ha and 48.53 thousand MT. Onion is a very common crop grown all over India and consumed by every family either raw as salad or cooked in various ways in all curries, fried, boiled or baked. It is also used in processed form e.g. flakes, powder, paste, crush and pickles. Ripe onions contain 85-90% water, 7-10% carbohydrates, 1-2% protein, 0.25% fat, 0.4% mineral matter, 0.18% calcium, 0.05% phosphorus, 0.7% iron, 120 IU vitamin B and 0.41% nicotinic acid. Primarily, the bulb is used as a vegetable but in some places the green onions are also cooked. Onion has great therapeutic value. They are stimulants and mild counter-irritant and used as herbal remedy for centuries in colds, coughs, bronchitis and many other diseases. It has been found beneficial in cardiovascular diseases, diabetes, cancer, and respiratory tract diseases.

Onion is produced in three seasons i.e. *rabi*, *kharif* and late *kharif* in our country. About 60% production comes from *rabi* crop while *kharif* and late *kharif* crops contribute 20% each. The *rabi* season crop of onion is harvested in April-May while *kharif* onion crop is available in the market in October to December. The *kharif* onion is produced in parts of Maharashtra, Gujarat, Karnataka and Rajasthan. The major portion of *rabi* season crop

is stored throughout the country. This stored material is available for domestic markets as well as for export from May to October. There is critical gap in supply of onion from October to December in the country and as a result of this prices shoot up. The *kharif* crop plays an important role in fulfilling consumer's demand and stabilizing the prices of onion in the country. If *kharif* crop is delayed or spoiled due to vagaries of monsoon, the prices increase very rapidly in October and remain high till January-February. *Kharif* onion, therefore, is most crucial in controlling market prices *vis-a-vis* making onions available to consumers. But at the onset of monsoon, the heavy showers, water stagnation and high incidence of diseases spoil the seedlings and restrict the healthy nursery production for *kharif* season. Therefore, *kharif* onion production through setts can be done to avoid the losses.

Department of Science and Technology, New Delhi has sanctioned a project for popularization of *kharif* onion to Dr YSP University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh which is being run by Dr Deepa Sharma, Scientist, Department of Vegetable Science at Dr YSP, College of Horticulture and Forestry, Neri, Hamirpur. Under this project, scientific technique of setts as well as bulb production is being disseminated to the farmers by conducting training and on farm demonstration. Many farmers of Chamba district have adopted this technique on commercial scale and sold their produce as green onion at the rate of 60 per kg in the months of September-October 2018 and 2019. Fully developed bulbs are being sold at an average price of 40 per kg. Many farmers raised *kharif* onion setts in their kitchen garden and harvested them as green or fully developed stage for domestic needs. *Kharif* onion is harvested from October to November when price of onion goes very high due to scarcity of onion. Therefore, *kharif* onion production earns



Production of setts

profits to the farmers and this technology needs to be popularized in the others parts of the state as well as in North India.

The production technology of *kharif* onion is given here.

Selection of variety

The selection of a suitable variety is most important. An ideal *kharif* variety should have early bulking, high photosynthetic efficiency, thin neck, resistance to diseases and tolerance to water logging. It is very difficult to get a perfect variety but a variety having 90 to 105 days maturity period with thin neck should be selected for *kharif* season. Varieties like Agrifound Dark Red, N-53, Baswant -780, Arka Kalyan perform well during the *kharif* season.

Planting time and method

The planting time of *kharif* onion varies from first week of June to second week of August in different *kharif* onion producing states. In Maharashtra, the largest *kharif* onion producer, it is planted from mid June to mid July. But in Himachal Pradesh due to heavy rains late *kharif* plantation using setts is more appropriate. The experimental trial conducted on the date of planting on yield of onion reveals that planting in second fortnight of August results in higher yield than June and July planting. The nursery for *kharif* onion is usually sown in March to produce setts.

Raising small setts/Bulblets

Successful raising of nursery during summer season is the main challenge for growing of *kharif* season crop because nursery production of *kharif* onion crop is often severely affected by cloudy atmosphere, late rains and incidence of various pests and diseases. However, it is possible to raise *kharif* onion crop very successfully through onion setts. For this purpose, small onion bulblets of *kharif* onion varieties like Agrifound Dark Red, Baswant 780, N-53 and Arka Kalyan are raised and stored for planting. Raised beds or flat beds are prepared depending upon the soil type. To plant one square meter area of the bed, 10 g of seed is sufficient. To produce setts for 1 ha area, approximately 20 kg seeds are required. The best time of sowing of seeds for getting quality setts/bulblets is mid February to the beginning of March. The field should be ploughed 5-6 times to break clods and well pulverized to hold water. For raising nursery, raised bed of 10-15 cm height, 1-1.2 m width and length as per convenience may be prepared. Apply 20-25 kg of well decomposed farmyard manure (FYM) and 100 g of 12:32:16 (NPK fertilizer) at the time of bed preparation and mix well with soil. Care should be taken not to over fertilize nursery beds as it will increase the sett size. Raised bed is recommended for nursery because in the case of flat bed, water moves from one end to the other and there is a possibility of washing away of seeds. Before sowing, seeds should be treated with thiram @ 2 g/kg of seed to avoid damage from damping off disease. Application of



Replanting of setts

Trichoderma viride @1,250 g/ha is also recommended to manage damping off and raise healthy seedlings. After sowing, the seeds should be covered with fine powdered farmyard manure or compost followed by light watering. Stop irrigation a week prior to harvesting of setts so that they get completely dried. The plants are left in the nursery beds up to May-June till their tops fall. Harvesting is done along with the tops and selected setts or bulblets (1.5 to 2.00 cm in diameter) are stored till August in a well-ventilated rooms. Such well stored setts are used for transplanting in the month of August.

Replanting of setts

The setts are replanted in well prepared fields in the second fortnight of August. Spacing of 15 cm between the rows and 10 cm between the plants should be maintained. For planting 1 ha area, 18-20 quintals of setts are required. Care should be taken while selecting setts for transplanting. Over and under sized setts should be avoided for better yield. The experimental trial conducted on effect of sett size on yield and quality of bulbs showed that large sized setts increase the bulb size but the problem of premature bolting and twin bulbs arises which increases the number of unmarketable bulbs whereas use of small setts leads to production of small sized bulbs which ultimately reduce yield. Medium setts of 1.5-2.0 cm diameter are ideal for

kharif onion production as they do not bolt much and the proportion of splitted bulbs and doubles are also minimum in this category.

Nutrient management

The recommended dose of fertilizers for *kharif* onion is 250 quintal FYM, 250 kg urea, 500 kg SSP, 100 kg MOP per hectare. The half of nitrogen and full doses of phosphorus, potassium should be applied at the time of field preparation while the remaining 50% of nitrogen should be applied twice as split doses after 1 month interval from the previous application. If fertigation facility is available, it should be given in 10 split doses after every five days. The foliar application of nutrients through water-soluble fertilizer and micronutrient mixture is helpful in supplementing the nutrient requirement. These should be applied between 45-75 days after transplanting to help in enlargement of bulbs.

Water management

Water requirement of *kharif* onion is much lesser than *rabi* crop. In general, *kharif* crop needs 5-8 irrigations, the late *kharif* crop requires 10-12 and *rabi* crop needs 12-15 irrigations. Onion being a shallow rooted crop, needs frequent light irrigations to maintain optimum soil moisture for proper growth and bulb development.



Harvesting of setts



Cutting and storage of setts

Irrigation needs to be stopped when the crop attains maturity (10-15 days before harvest) and the top starts falling which helps in reducing the rotting during storage.

Harvesting

In *kharif* season, since tops do not fall, bulbs are harvested soon after the colour of leaves changes to slightly yellow and red pigmentation on bulbs develops. Since onion bulbs are normally formed at the soil surface, it is sometimes possible in sandy soils to pull the mature bulbs by hand. Where conditions make hand pulling impossible, crop is harvested by loosening the bulbs with a fork or hoe before lifting them. The average yield of 200-250 quintals/ha can be obtained from 1 ha area. The leaves are cut leaving about 2-2.5 cm tops above the bulb after complete drying. This practice helps to increase the dry matter content. If tops are cut too close, the neck does not close well and provides entry for decay organisms.

Curing and storage

The *kharif* season crop matures in 90-105 days but neck fall does not occur and plant remains in active

growth stage. The bending of neck of plants by rolling of empty barrel two or three days before harvesting is useful for increasing shelf life. The curing of *kharif* onion is important for better shelf life but high humidity and cloudy weather do not facilitate curing resulting in more losses.

The *kharif* onion production technology was demonstrated on the farmer's field and an encouraging response was received. The farmers sold their produce from the field itself and got returns thrice to the input cost. As a result, the demand for seed and setts of onion increased in the study area and the farmers now see *kharif* onion cultivation as a lucrative enterprise. The technology holds a high potential for the farmers of Himachal Pradesh.

For further interaction please write to:

Drs Deepa Sharma, Sanjeev K Banyal and Aanchal Chauhan, Dr. Y S Parmar University of Horticulture and Forestry, Hamirpur, Himachal Pradesh 177 001 *Corresponding author.
E-mail: deepabanyal@gmail.com

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Telefax: 011-25843657; E-mail: bmicar@gmail.com