



Seed Production Technology of Kachri (*Cucumis callosus*)

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Abstract

Kachri (*Cucumis callosus*), a crucial cucurbit crop thriving in the arid Thar Desert, is known for its resilience to severe abiotic stresses such as drought, salinity, and extreme temperatures. This plant is integral to the local diet and culture, used in various culinary preparations and as a dehydrated product with high market value. Given its economic and cultural importance, maintaining genetic purity during seed production is essential. Kachri's seed production requires careful management to ensure high-quality yields and genetic consistency. This involves selecting suitable varieties, maintaining isolation distances to prevent cross-pollination, and implementing precise crop management techniques. For effective seed production, isolation distances of 500-800 meters from other *Cucumis* species are necessary to prevent genetic contamination. The ideal sowing times are mid-February and mid-July, with seedling management involving systematic removal of self-grown and other *Cucumis* plants. Field inspections are crucial at various growth stages, including germination, flowering, and fruit maturation, to ensure purity and quality. Harvesting occurs when fruits are mature but not overly ripe, followed by careful seed extraction, drying, and cleaning. Proper seed storage in cool, dry conditions is vital to maintain viability over time. The steps outlined provide a comprehensive approach to producing high-quality kachri seeds, supporting both commercial production and the preservation of genetic integrity. This guide is essential for maximizing yield and maintaining the crop's cultural and economic value.

Keywords: Kachri (*Cucumis callosus*), Ventilation, Seedling, Drying, Dehydration

Introduction

Kachri (*Cucumis callosus*) is a commercially important cucurbit that grows in the arid regions of the Thar Desert. It tolerates water desiccation and high temperatures from seedling to all the growth phases. During the life cycle, a plant faces many abiotic stresses such as drought, salinity, high and low temperatures, ultra violet radiation, excess or insufficient light, heavy metal toxicity, air pollution, anoxia and ozone etc. These abiotic stresses can result in severe yield loss to this crop. The mature fruits are usually cooked with various vegetable preparations, chutneys, pickles and also used for garnishing the vegetables or salad (Goyal and Sharma, 2009; Singh and Joshi, 2010). Mature fruits are also dehydrated for off-season use. Kachri has a great significance in social, cultural and religious occasions of desert dwellers. Fresh fruits of kachri are used in Diwali Pooja and a special gift pack, Dibai is sent to kith and kin which contains dehydrated conventional vegetables/fruits like kachri, ker, sangri, tinda etc. Kachri is one of the components of the delicious vegetable popularly known as panchkuta in the desert districts of northern western India. The mature fruits are peeled, dried as whole or sliced and can be stored as such or in powder form. The dehydrated

fruits are sold @ Rs. 30-50 per kg and thus have great potential for exploitation as an industrial crop. Kachri powder is used as souring agent in combination with chillies, coriander, turmeric, cumin, methi and other spices to manufacture various kind of curry powder. Kachri powder is also used in combination with various salts, black pepper, curing, ginger and sugar to prepare churan. (Samadia, 2007).

For seed production of Kachri varieties, all these crop techniques and management systems have to be adopted so that healthy and abundant yields can be obtained. Along with this, special things have to be kept in mind to maintain the genetic characteristics and purity of the variety because fertilization and fruit setting take place in the crop through cross-pollination. Keeping this principle in mind, only one variety of Kachri seed can be produced at a time. Can be done at one place and plants/crops of other varieties or species cannot be grown within a distance of 500-800 meters from this crop area. Similarly, varieties of Cucumis species like Mat-Kachri, Foot Cucumber (Kakadiya), Cucumber, Salad Cucumber, Arya Cucumber, Melon etc. and their self-grown plants should also not be grown at a distance of 500-800 meters from the Kachri seed production area because in all these Cucumis species, fruit set occurs through mutual cross-pollination, due to which their genetic purity is affected. Kachri, Mat-Kachri, Foot Cucumber and Cucumber are the local species here, hence their plants grow spontaneously along with the crops in all the fields of this region and the number of plants of these species per hectare has also been found to be high which are some of the major crops (Gadekar *et al.* 2023)

In arid and semi-arid areas, seed production of Kachri is successfully done as summer and rainy season crops. This can be done and the most suitable time for sowing work is mid-February and mid-July. For seed production, only one variety (AHK-119) is sown in one crop field and crop production through furrow or drop technique has been found to be the most safe and suitable. For seed production, seeds are sown in the fields in rows and at specific places and 2-3 seeds are sown at one sowing site. After germination, when the plants develop 2-4 true leaves or after 18-21 days, the remaining ones are removed by placing one healthy plant at each sowing site. During the same time period, the entire crop area is systematically screened so that the self-grown plants of this species and other Cucumis species do not remain in the crop area and this process is repeated 2-3 times continuously at 18-21, 25-35 and 45-50 days respectively. Should be done. To maintain the genetic purity of Kachri variety, 500-800 meters of land near its crop area has to be closely monitored 2-3 times and if there are plants of the above mentioned species, they should be removed from time to time (Samadia, 2003 and Samadia, 2007)

For seed production, in the Kachri crop, the field has to be thoroughly checked 3-4 times from the time of germination till the first harvest, so that undesirable plants can be removed from time to time. This work is done in the field respectively at 18-21 days after sowing, when the shoots are pruned, at 25-35 days. But it has been found to be best to do this when the male and female flowers start blooming in the plants, at 45-50 days when the fruit set starts and at 65-70 days when the fruit matures and the first harvesting starts. In Kachri, at the time of first harvest, it has been found most appropriate to inspect the entire crop area and collect fruits from its central area for seed collection and only the fruits of 3-4 consecutive harvests from the crop in the central area of the field can be used for seed production. Should be taken in. After harvesting, the fruits should be stored in a safe place and then uniform fruits should be sorted and cut into two pieces to store the seeds. Tie the cut fruits in a polythene sheet or keep them in plastic tanks for 2-3 days. After that, after washing them in water, the peels and seeds are separated and the seeds are taken in a sieve, washed again with water and dried in a shady place. Clean the dried seeds thoroughly and store them in polythene bags or plastic boxes for 4-5 years (Bhuiyan *et al.* 2009). Kachri, often referred to as "wild cucumber" or "bottle gourd" (*Cucumis melo* var. *agrestis*), is a crop commonly

grown in parts of South Asia. Seed production technology for kachri involves several key steps to ensure high-quality seeds and a successful harvest. Here's a comprehensive guide:

1. Selection of Varieties: Choose the Right Variety: Select varieties that are well-suited to your local climate and soil conditions. Check for disease resistance and high yield potential.

2. Seed Production Planning: Isolation Distance: To prevent cross-pollination with other cucumber varieties, maintain an isolation distance of at least 200 meters.

Field Preparation: Prepare a clean, well-drained seedbed with a pH of 6-7. Incorporate organic matter and ensure good soil fertility.

3. Planting: Sowing: Sow seeds directly in the field or start seedlings in a nursery. Seeds can be sown in rows with a spacing of 1-2 meters between rows.

Transplanting: If using seedlings, transplant them when they have 2-3 true leaves and ensure adequate spacing.

4. Pollination: Insect Pollination: Kachri relies on insect pollinators, especially bees. Ensure that your field is attractive to pollinators and avoid using pesticides that harm them.

Hand Pollination: In case of low natural pollinator activity, you may need to hand-pollinate flowers. This involves transferring pollen from male to female flowers manually.

5. Crop Management: Watering: Maintain consistent soil moisture, but avoid waterlogging. Drip irrigation is beneficial for efficient water use.

Fertilization: Apply balanced fertilizers, with an emphasis on phosphorus and potassium to support seed development.

Weeding and Pest Control: Regularly remove weeds and manage pests and diseases using integrated pest management (IPM) practices.

6. Harvesting: Timing: Harvest when the fruits are mature but before they become overly ripe. Mature fruits are typically tan and hard.

Seed Extraction: Cut the fruit open and extract the seeds. Clean the seeds to remove any pulp and debris.

7. Seed Processing: Drying: Spread the cleaned seeds in a thin layer to dry in a well-ventilated area, away from direct sunlight.

Cleaning: Further clean seeds to remove any remaining debris and broken seeds.

8. Seed Storage: Packaging: Store seeds in airtight containers or bags to prevent moisture absorption.

Conditions: Keep seeds in a cool, dry place. Ideal storage conditions are temperatures below 10°C and low humidity.

9. Quality Testing: Germination Test: Regularly test seed germination rates to ensure viability.

Purity and Health: Check for seed purity and health, ensuring they are free from diseases and contaminants.

By following these steps, you can effectively produce high-quality kachri seeds, which will help in maintaining the crop's genetic purity and maximizing yield.



Fruit production of kachri



Soak fruit with water for seed extraction



Seed extracted with fruit pulp



Seed production of kachri

Conclusion

In conclusion, the successful seed production of Kachri hinges on meticulous planning and management practices to maintain genetic purity and achieve high-quality yields. Key steps include selecting the right varieties, ensuring proper isolation distances, and implementing rigorous field management and pollination strategies. Effective seed processing and storage further enhance seed viability and quality. By adhering to these guidelines, growers can optimize Kachri production and capitalize on its commercial potential, supporting its role in local diets and cultural traditions.

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