



Garlic Seed Production

(*Vishwanath Rohidas Yalamalle and Chandu Singh)

ICAR-Indian Agricultural Research Institute, New Delhi

*Corresponding Author's email: vishwanath_yal@yahoo.com

Garlic (*Allium sativum* L.) is one of the most important *Allium* crops, following onions, widely cultivated throughout the world for its culinary and medicinal uses. India ranks second in both area (3.92 lakh hectares) and production (31.90 lakh tons), accounting for 12% of the harvested area and 11% of production, with a productivity of 8.13 t/ha. However, compared to leading countries, the productivity of Indian garlic is low (FAO, 2021). The main reason for low garlic productivity in our country is the lack of high-yielding varieties and the cultivation of garlic mostly in tropical and subtropical India, which is a short-duration crop compared to the long-duration crops in other countries.

Furthermore, the high virus load degenerates the variety, leading to lower yields. Garlic, being a non-flowering plant, has become sterile through evolution, domestication, and anthropogenic selection. Although fertility is reported in garlic, commercial success is still awaited. The apomictic nature of propagation has limitations in crop improvement, and vegetative propagation has inherent disadvantages, such as a low rate of multiplication, additional costs incurred in bulk storage and transportation, losses during storage, and the perpetuation of pests and diseases, with viruses being particularly significant. Techniques for garlic seed production need refinement for improved productivity and sustainability.

Land requirement: Land used for seed production of garlic shall be free of volunteer plants.

Planting material: For certified seed production foundation seed from State Agriculture Universities, ICAR-Directorate of Onion and Garlic Research, Pune, NHRDF, Nashik or National Seeds Corporation may be contacted.

The selection of planting material and bulb treatment is a crucial step in garlic cultivation. It is recommended to choose bigger-sized cloves, as studies have indicated a positive correlation between clove size and bulb yield. Larger cloves typically result in higher yields. To enhance the health and disease resistance of the cloves, it is advisable to treat them with 2g/kg captan before planting. This pre-planting treatment with captan helps protect the cloves from potential diseases and ensures a healthier start for the garlic crop. This proactive measure can contribute to overall crop quality and productivity.

Climate and seasons: Garlic cultivation is predominantly undertaken during the rabi season, although the specific planting times vary across regions. In the hilly region of Tamil Nadu, garlic is typically grown in April-May and September-October. In states like Madhya Pradesh, Maharashtra, Karnataka, and Andhra Pradesh, the planting season spans from September to October. Moving to the northern plains of India, garlic is commonly planted from September to November. These variations in planting times are influenced by regional climate conditions and local agricultural practices. It's essential for garlic farmers to consider these regional variations to optimize the cultivation process and ensure a successful garlic crop.

Planting method and seed requirement: To achieve better seed yield, it is recommended to plant garlic cloves on raised beds with a drip irrigation system set at a spacing of 120cm. The individual cloves should be planted at a distance of 10cm from each other. This arrangement allows for 12 cloves to be planted in a single flatbed row. Maintain a spacing of 15cm between rows to provide adequate room for the garlic plants to grow and facilitate ease of cultivation. This organized planting pattern ensures optimal utilization of space and resources. For cultivating one hectare of garlic, approximately 500kg of seed is required. This information provides a guideline for garlic farmers to plan their planting strategy, ensuring the proper spacing and quantity of seed for efficient and productive cultivation.

Field Inspection: A minimum of two inspections shall be made as follows;

1. The first inspection shall be made when plants are large enough to verify isolation, Off-types including and other relevant factors.
2. The second inspection shall be made when leaves begin to fall and before lifting of bulbs to verify isolation, Off-types and other relevant factors.

Field Standards:

<i>Contaminants</i>	<i>Minimum distance (meters)</i>	
	<i>Foundation</i>	<i>Certified</i>
1	2	3
Fields of other varieties	5	5
Fields of the same variety not conforming to varietal purity requirements for certification	5	5

B. Specific requirements

<i>Factor</i>	<i>Maximum permitted (%)*</i>	
	<i>Foundation</i>	<i>Certified</i>
1	2	3
*Off-types	0.10	0.20

Plant Nutrition: For an effective nutrient management strategy in garlic cultivation, it is recommended to apply 20 tons per hectare of Farm Yard Manure (FYM) to enhance soil structure and fertility. Additionally, 100:50:50:50 kg/ha of NPKS (Nitrogen, Phosphorus, Potassium, and Sulfur) is advised, with the first application of 50:50:50:50 kg/ha NPKS at the time of planting. The nitrogen component should be further divided into two splits: 50 kg/ha applied initially and the remaining 50 kg/ha divided into 25 kg/ha each, applied 30 and 45 days after planting. This balanced approach ensures that garlic plants receive the necessary nutrients for optimal growth and yield throughout their growth stages.

Roguing: is a critical practice in garlic cultivation, necessitating regular visits to the plot. The removal of yellow and lanky plants is imperative, as these may indicate potential disease or nutrient deficiencies. Additionally, plants exhibiting differential maturity and height should

be promptly removed to maintain uniformity in the crop. This proactive approach helps to maintain varietal purity and reduces the spread of viruses and diseases.

Weed management: For effective weed management in garlic cultivation, it is recommended to spray (Oxyfluorfen 23.5% EC) Goal® herbicide at a concentration of 1.5 ml per liter after the planting of cloves. This helps control weed growth and establishes a favorable environment for garlic plants. Additionally, conduct one weeding operation between 45 to 60 days after planting to further manage and suppress weed growth. This combined approach ensures that weeds are adequately controlled during critical stages of garlic growth, minimizing competition for nutrients and optimizing overall crop performance.

Harvesting and curing: The bulbs are typically harvested in the month of March to April. For the effective curing and storage of garlic harvested bulbs must be cured. The bulbs are normally stored for 5–6 months for seed purposes, it is advisable to leave the mature plants in the field for 3-4 days post-harvest. Subsequently, shade curing by tying the garlic bulbs in bundles should be performed for a duration of 15 days. It is essential to store the bulbs with their leaves intact until planting.

Seed yield: The average seed yield can range from 6-10 tons per hectare, and this yield is significantly influenced by the choice of garlic variety and the effectiveness of management practices employed throughout the cultivation process. Adopting appropriate curing and storage techniques is crucial for preserving garlic quality and ensuring a successful crop for future planting.

Seed (Planting stakes) Standards

1. The average diameter of each bulb shall not be less than 2.5 cm or 25 gm in weight.
2. The seed material shall be reasonably clean, healthy and firm and shall conform to the varietal characteristics of the variety. The bulbs not conforming to varietal characteristics shall not exceed 0.10% and 0.20% (by number) for Foundation and Certified seed classes respectively.
3. Cut, bruised, cracked, immature or those damaged by insects, slugs or worms shall not exceed more than 2.0% (by weight).