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Scientific Cultivation of Summer Sesame for Higher Income

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Introduction

Sesame (Sesamum indicum), an ancient oilseed crop, holds the distinction of being the world's first cultivated oilseed. Its historical significance in India dates back to antiquity where it was revered not only for its nutritional value but also for its cultural and medicinal importance. Despite its rich legacy, sesame is often overlooked as a profitable crop due to its relatively low yield under traditional farming practices. However, with the adoption of scientific cultivation methods, particularly during the summer season, sesame can emerge as a lucrative crop for farmers. Sesame is cultivated across various Indian states, including Madhya Pradesh, Gujarat, Punjab, Haryana, Uttar Pradesh, Bihar, Rajasthan, West Bengal, Maharashtra, and Himachal Pradesh.

While sesame is an energy-dense crop, it is frequently grown under suboptimal conditions, leading to diminished productivity. By integrating advanced agricultural techniques and improved seed varieties, farmers can significantly enhance sesame yields. Summer cultivation, in particular, offers a favorable environment for sesame growth, as the warm climate promotes robust germination and minimizes pest and disease pressures. Nutritionally, sesame is a powerhouse, containing essential minerals such as copper, manganese, calcium, phosphorus, magnesium, iron, zinc, and molybdenum, as well as vitamin B1, selenium, and dietary fiber. It boasts a protein content of 20% and an oil content ranging from 45% to 50%. Although sesame can be cultivated thrice annually, summer cultivation stands out for its higher yields and economic viability.

Climatic Requirements

Sesame thrives in a warm tropical climate, requiring long, hot growing seasons. Optimal growth occurs at temperatures between 25°C and 40°C, with germination being adversely affected at temperatures below 20°C. The crop is traditionally grown during the rainy (Kharif) season, but summer cultivation has gained prominence due to its higher productivity and reduced pest incidence.

Soil Conditions

Sesame is adaptable to a wide range of soil types, but loamy soils are ideal for achieving optimal yields. Highly sandy and alkaline soils are less suitable. The crop can be successfully cultivated in sandy loam to black soils, with a preferred pH range of 5.5 to 8.2. Proper drainage is critical, as waterlogging can severely impede growth.

Field Preparation and Sowing

Prior to sowing, the field should undergo deep plowing to ensure proper soil aeration and structure. Field leveling is essential to create a uniform seedbed. Incorporating 8-10 tons of farmyard manure or 4-5 tons of vermin-compost per hectare during the final ploughing enriches the soil with organic matter and nutrients. Since seed coat of sesame is thick, adequate soil moisture at the time of sowing is crucial for successful germination. Summer sesame is typically sown in the month of February. Two sowing methods are commonly employed: broadcasting and line sowing. Broadcasting requires 5-6 kg of seeds per hectare, while line sowing, which ensures better spacing and resource utilization, requires only 3-4 kg seed per hectare.

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Improved Varieties for Summer Cultivation

Several high-yielding sesame varieties have been developed for summer cultivation, each with distinct characteristics:

1. Krishna: Yields 6.5 quintals per hectare, matures in 85-90 days, and has an oil content of 46.3%.
2. Pragati: Yields 7.5 quintals per hectare, matures in 80-85 days, and has an oil content of 50%.
3. Jawahar 8 and Jawahar 11: Yield 6.5-7.0 quintals per hectare, mature in 80-85 days, and have an oil content of 46-50%.
4. TKG 21 and TKG 22: Mature in 80-85 days, yielding 6-8 quintals per hectare.
5. JT 7, JT 81, and JT 27: Mature in 75-85 days, yielding 8-10 quintals per hectare.

Sowing Time and Seed Rate

The optimal sowing period for summer sesame is between February 25 and March 10. For broadcasting, a seed rate of 5-6 kg per hectare is recommended, while line sowing requires 3-4 kg seed per hectare. To maximize yields, maintain a plant-to-plant distance of 10 cm and a row-to-row distance of 30 cm.

Seed Treatment

To mitigate the risk of root and stem rot, seeds should be treated with 3 grams of Thiram or Captan per kilogram before sowing. For bacterial blight, soaking seeds in a solution of 2.5 grams of Streptocycline in 10 liters of water for two hours is effective.

Nutrient Management

Balanced nutrient application is vital for achieving high yields. Incorporate 8-10 tons of farmyard manure per hectare during the final ploughing. Additionally, apply 40 kg of nitrogen, 20 kg of phosphorus, 20 kg of potash, and 25 kg of sulphur per hectare. Half the nitrogen, full dose of phosphorus, potash and sulphur should be applied as basal dose at the time of sowing, and the balance amount of nitrogen should be applied 25-30 days after sowing during the first weeding.

Irrigation Management

In summer, sesame requires irrigation every 5-8 days. Critical irrigation stages include the 4-5 leaf stage, flowering stage, and seed formation stage. Excessive irrigation during flowering should be avoided to prevent flower drop.

Weeding and Weed Control

The first weeding should be conducted 15-20 days after sowing, followed by a second weeding 30-35 days after sowing. Thinning should be performed to maintain a plant-to-plant distance of 10 cm. For chemical weed control, apply Alachlor 50 EC at 1.25 liters per hectare or Pendimethalin at 1.0 kg active ingredient per hectare within 2-3 days of sowing.

Crop Rotation and Intercropping

short duration makes it suitable for intercropping and crop rotation systems. Examples include:

Intercropping: Sesame + Maize (2:1), Sesame + Pigeon Pea (2:1)

Crop Rotation: Rice - Potato - Sesame, Rice - Wheat - Sesame, Maize - Wheat - Sesame, Potato - Wheat/ Sesame

Pest and Disease Management

Leaf and Pod Borer: Spray Acephate 75 SP at 500 grams per hectare 45 days after sowing, followed by

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Cypermethrin 25 EC at 400 ml per hectare 15 days later.

Leaf Roller: Apply Methyl Parathion 2% dust at 25 kg per hectare.
Diseases: For phyllody, treat seeds with Methyl-O-Demeton. For leaf spot and blight, spray Captan or Mancozeb. For powdery mildew, use sulfur powder or Carbendazim.

Harvesting and Threshing
Harvesting should commence when the leaves turn yellow and started falling. Delayed harvesting can result in pod shattering and seed loss. After cutting the plants at the base, bundle them and allow them to dry in the field. Threshing should be done using sticks or light beating to separate the seeds.

Yield
With scientific cultivation practices, sesame yields can range from 6 to 8 quintals per hectare, offering farmers a profitable and sustainable crop option.

This comprehensive approach to sesame cultivation underscores the importance of integrating traditional knowledge with modern scientific techniques to enhance productivity and profitability. By adopting these practices, farmers can unlock the full potential of sesame as a valuable crop in their agricultural systems.