



AGRI WISE WAY
.com

[Home](#) [Subjects +](#) [About](#) [Contact](#) [Important +](#)

[Shop Mens Sweatshirts](#)
TenaxTees

Jowar Crop Cultivation

[Leave a Comment](#) / [Agronomy](#) / By [Akshata Kale](#)

Introduction

Jowar Crop, scientifically known as *Sorghum bicolor*, is a versatile cereal crop widely cultivated for its grains, fodder, and biofuel potential. Originating from Africa, jowar has become a staple food crop in many regions of the world due to its adaptability to diverse agro-climatic conditions and nutritional value. In this detailed guide, we delve into the agronomy of jowar cultivation, covering its scientific background, geographic distribution, economic importance, seed characteristics, cultivation practices, water management, harvesting techniques, major diseases, and yield potential.



Scientific Background



Finish the time-consuming stuff. Fast!

Sponsored by: Intel® Core® Ultra

[SHOP NOW](#)

Recent Posts

- The Importance and Maintenance of Micro Irrigation Systems
- Plant Growth Substances, Photoperiodism, and Vernalization: A Comprehensive Exploration
- Definition and Scope of Farm Economics and Management
- Important Soil Types of India

of Jowar

- **Scientific Name:** Sorghum bicolor
- **Origin:** Africa
- **Geographic Distribution:** Cultivated worldwide, with major production regions in Africa, Asia, and the Americas.
- **Economic Importance:** Jowar is a significant food and fodder crop, providing sustenance for millions of people and livestock worldwide. It is also used for biofuel production and industrial applications.

Seed Characteristics and Seed Rate

- **Seed:** Jowar seeds are small, oval-shaped, and usually reddish-brown or white in color. They have a hard outer seed coat and contain a starchy endosperm.
- **Seed Rate:** The recommended seed rate for jowar varies depending on factors such as soil type, planting method, and spacing. Generally, the seed rate ranges from 8 to 10 kg per hectare for dryland cultivation and 12 to 15 kg per hectare for irrigated cultivation.

Advantages of Transplanted Jowar Crop

1. **Early Establishment:** Transplanted jowar crops establish earlier than direct-seeded ones, as seedlings have already developed roots and foliage before being transplanted into the main field.
2. **Uniform Planting:** Transplanting allows for precise spacing and distribution of jowar seedlings in the field, ensuring uniform plant density and arrangement. This uniformity promotes efficient use of resources such as water, nutrients, and sunlight, leading to more consistent growth and yield across the field.
3. **Optimized Plant Spacing:** With transplanted jowar crops, farmers have greater control over plant spacing and population density, allowing them to tailor planting patterns according to soil fertility, moisture availability, and crop variety. Optimal plant spacing facilitates better light interception, airflow, and nutrient uptake, maximizing crop productivity.
4. **Improved Crop Management:** Transplanted jowar crops are easier to manage in terms of irrigation, fertilization, and pest control compared to direct-seeded crops. Farmers can accurately monitor and adjust inputs based on the growth stage and condition of individual plants, optimizing resource use efficiency and minimizing crop stress.
5. **Reduced Weed Competition:** By establishing a dense and uniform crop stand early in the season, transplanted jowar crops suppress weed growth and competition more effectively than direct-seeded crops. This reduces the need for herbicide applications and manual weeding, saving labor and reducing production costs.
6. **Enhanced Stress Tolerance:** Transplanted jowar seedlings are

Cultivation of Sapota (Chikoo) Crop

Enjoy greater peace of mind

Be confident knowing you have built-in protection keep your data more secure and private.

Sponsored by: Intel® Core® Ultra

Shop

better equipped to withstand environmental stresses such as drought, heat, and pest pressure compared to seeds sown directly into the soil. Their advanced root and shoot development provide resilience against adverse conditions, ensuring more consistent yield performance.

7. **Extended Growing Season:** Transplanted jowar crops often have a longer growing season and extended reproductive period compared to direct-seeded crops, allowing for additional tillering, flowering, and grain filling stages. This prolonged growth period enhances yield potential and grain quality, contributing to overall profitability.
8. **Facilitated Crop Rotation:** Transplanted jowar cultivation facilitates crop rotation and intercropping practices, as seedlings can be transplanted into prepared fields after the harvest of preceding crops. This rotational flexibility helps break disease cycles, improve soil health, and diversify farm income streams.

Nursery Practices for Transplanted Jowar

1. **Seedbed Preparation:**
 - Prepare a well-drained seedbed with fine tilth and adequate moisture retention capacity.
 - Level the seedbed surface to ensure uniform germination and seedling emergence.
 - Incorporate organic matter such as compost or farmyard manure to improve soil fertility and structure.
2. **Seed Treatment:**
 - Treat jowar seeds with fungicides or biocontrol agents to protect against seed-borne diseases such as damping-off and seedling blight.
 - Use recommended seed treatments and follow label instructions to ensure effective disease control without harming seed viability.
3. **Seed Sowing:**
 - Sow jowar seeds in nursery trays, seedbeds, or containers filled with well-prepared soil.
 - Maintain proper seed spacing and depth to facilitate seed germination and emergence.
 - Cover the seeds lightly with soil and gently firm the surface to ensure good seed-to-soil contact.
4. **Moisture Management:**
 - Maintain optimal soil moisture levels in the nursery to promote seed germination and early seedling growth.
 - Use drip irrigation, sprinklers, or manual watering methods to provide consistent moisture without waterlogging or drying out the soil.
 - Monitor soil moisture regularly and adjust irrigation frequency and duration as needed based on weather conditions and crop growth stage.
5. **Temperature and Light:**
 - Provide adequate light and warmth for seed germination and seedling development by placing the nursery in a sunny location or using artificial lighting.
 - Protect seedlings from extreme temperatures, frost, and wind damage by using shade nets or row covers as needed.
6. **Weed Control:**
 - Implement weed control measures in the nursery to minimize competition for nutrients, water, and light.

- Remove weeds manually or use herbicides judiciously following label instructions to avoid damage to jowar seedlings.

7. **Nutrient Management:**

- Apply balanced fertilizer doses to nursery soil or use nutrient-rich compost to support healthy seedling growth.
- Monitor nutrient levels in the soil and adjust fertilization practices based on soil test results and crop nutrient requirements.

8. **Thinning and Transplanting:**

- Thin out overcrowded seedlings in the nursery trays or seedbeds to maintain optimum plant density and spacing.
- Select healthy and vigorous seedlings for transplanting into the main field, discarding weak or diseased ones.
- Transplant seedlings at the recommended age and growth stage (typically 3-4 leaf stage) to minimize transplant shock and ensure successful establishment in the field.

Water Management in Jowar Cultivation

- **Irrigation:** Provide timely and adequate irrigation during critical growth stages such as germination, tillering, flowering, and grain filling.
- **Water Conservation:** Implement water-saving techniques such as drip irrigation, mulching, and soil moisture monitoring to optimize water use efficiency.
- **Rainfed Cultivation:** Jowar is well-adapted to rainfed cultivation in regions with adequate rainfall and moisture-retentive soils. Proper soil and water conservation practices are essential for rainfed jowar production.

Table 1: Recommended Water Requirements for Jowar

Growth Stage	Water Requirement (mm)
Germination	20-30
Tillering	40-60
Flowering	80-100
Grain Filling	60-80

Main Field Preparation

1. **Land Selection and Clearing:**
 - Choose well-drained fields with good soil fertility, adequate sunlight, and proper water availability for jowar cultivation.
 - Clear the selected land of any debris, rocks, weeds, and crop residues to create a clean and uniform planting surface.
2. **Fertilizer Application:**
 - Apply balanced fertilizers based on soil test recommendations and jowar nutrient requirements.
 - Incorporate fertilizers evenly into the soil during land preparation to ensure uniform distribution of nutrients and promote healthy plant growth.
3. **Seedbed Preparation:**
 - Create seedbeds or planting rows with proper spacing and

orientation to facilitate jowar planting and subsequent crop management activities.

- Use row markers or planting guides to ensure straight and uniform rows, optimizing plant spacing and population density.

4. **Weed Control:**

- Control weeds in the main field through pre-planting herbicide applications, manual weeding, or mechanical cultivation.
- Maintain weed-free conditions during jowar establishment to reduce competition for nutrients, water, and light.

Harvesting and Threshing of Jowar

- **Harvesting:** Harvest jowar crops when grains are fully matured and moisture content is below 20%. Cut the panicles with sickles or mechanical harvesters and bundle them for threshing.
- **Threshing:** Thresh the harvested panicles to separate grains from the stalks using manual or mechanical threshers. Clean and dry the grains before storage.

Rainfed Jowar Cultivation

1. **Selection of Suitable Varieties:**

- Choose jowar varieties that are well-adapted to rainfed conditions and have traits such as drought tolerance, early maturity, and good yield potential under moisture stress.

2. **Timing of Planting:**

- Plant jowar seeds at the onset of the rainy season when soil moisture levels are sufficient for germination and early growth.
- Timing may vary depending on local climate patterns and rainfall distribution, but planting typically occurs during the early monsoon months.

3. **Seed Rate and Spacing:**

- Use appropriate seed rates and spacing to optimize plant population density and resource utilization in rainfed jowar fields.
- Higher seed rates may be recommended to compensate for lower germination rates and establishment success under variable moisture conditions.

4. **Soil Preparation:**

- Prepare the soil well in advance of planting to ensure good seed-to-soil contact and adequate soil moisture retention.
- Implement soil conservation measures such as contour plowing, mulching, and soil bunds to minimize soil erosion and conserve moisture.

Ratoon Sorghum Crop

- **Definition:** Ratoon sorghum refers to the regrowth of jowar plants from stubble or rootstocks after the initial harvest.
- **Advantages:** Ratoon cropping allows for multiple harvests from a single planting, reducing production costs and increasing overall crop productivity. It also helps improve soil health and fertility by adding organic matter and enhancing nutrient cycling.

Yield Potential of Jowar

- **Yield:** The average yield of jowar varies depending on factors such as variety, agro-climatic conditions, and management practices. Under optimal conditions, jowar yields can range from 1 to 3 tonnes per hectare.

Table 2: Comparative Yield Potential of Jowar Varieties

Variety	Yield Potential (tonnes/ha)
Hybrid Varieties	2.5-3.0
Improved Varieties	2.0-2.5
Local Varieties	1.0-1.5

Major Diseases of Jowar

1. Grain Mould:

- **Symptoms:** Grain mould manifests as discolored, moldy, and shriveled jowar grains with a foul odor. Infected grains may have a slimy or powdery appearance, indicating fungal growth.
- **Survival and Spread:** Grain mould pathogens survive in soil and crop debris, infecting jowar grains during flowering and grain filling stages. Spread occurs through wind, rain splash, and contaminated seeds.
- **Favorable Conditions:** Warm and humid conditions during flowering and grain maturation favor grain mould development. Poor crop sanitation and high plant density increase disease incidence.

2. Charcoal Rot:



- **Symptoms:** Charcoal rot initially causes wilting and yellowing of jowar plants, followed by dark, sunken lesions on stems and roots resembling charcoal. Infected plants wilt and die prematurely.
- **Survival and Spread:** Charcoal rot survives in soil and plant debris as sclerotia, which germinate under warm and dry conditions.

Spread occurs through irrigation water, farm equipment, and infected seeds.

- **Favorable Conditions:** High temperatures (above 30°C) and water stress promote charcoal rot development. Sandy soils with poor drainage and low organic matter are conducive to disease.

3. Downy Mildew:

- **Symptoms:** Downy mildew appears as pale yellow to orange lesions on jowar leaves, accompanied by white to grayish fungal growth on the lower leaf surface. Severe infections cause leaf curling, stunting, and plant death.
- **Survival and Spread:** Downy mildew pathogens survive as oospores in soil and as sporangia on infected plant debris. Spread occurs through wind, rain splash, and infected seeds.
- **Favorable Conditions:** Cool and moist conditions (20–25°C) with high humidity favor downy mildew development. Overcrowded planting and poor air circulation increase disease severity.

4. Leaf Spot:



- **Symptoms:** Leaf spot diseases cause small, circular to irregular lesions on jowar leaves, which may coalesce and lead to extensive leaf necrosis and defoliation. Severe infections weaken plants and reduce yield.
- **Survival and Spread:** Leaf spot pathogens survive in soil and crop debris as spores or mycelium. Spread occurs through rain splash, wind, and contaminated farm equipment.
- **Favorable Conditions:** Warm and humid conditions with frequent rainfall favor leaf spot development. Dense plant canopy, poor air circulation, and prolonged leaf wetness increase disease severity.

5. Red Rot:

- **Symptoms:** Red rot causes reddish-brown discoloration and rotting of jowar stalks and panicles, with sunken lesions and black fungal structures (acervuli) on the surface. Infected panicles may show discoloration and decay.
- **Survival and Spread:** Red rot survives in soil and infected plant debris as mycelium and sclerotia. Spread occurs through rain splash, wind, and contaminated seeds.
- **Favorable Conditions:** Warm temperatures (25–30°C) and high humidity promote red rot development, especially during flowering and grain filling stages. Poor drainage and excessive irrigation exacerbate disease severity.

6. Loose Smut:

- **Symptoms:** Loose smut causes elongated, swollen structures filled

with dark brown to black spores on jowar panicles and seeds. Infected seeds may become distorted, discolored, or replaced entirely by smut spores.

- **Survival and Spread:** Loose smut survives in soil and infected seeds as teliospores. Spread occurs through wind, rain splash, and contaminated planting material.
- **Favorable Conditions:** Cool and moist conditions (15–20°C) during flowering and grain filling stages favor loose smut development. Overcrowded planting and poor seed quality increase disease incidence.

7. Rust:

- **Symptoms:** Rust diseases cause orange to reddish-brown pustules or lesions on jowar leaves, stems, and panicles, leading to yellowing, wilting, and premature senescence of infected tissues.
- **Survival and Spread:** Rust pathogens survive in soil and infected plant debris as spores or mycelium. Spread occurs through wind, rain splash, and contaminated seeds.
- **Favorable Conditions:** Moderate temperatures (20–25°C) and high humidity promote rust development, especially during cool, wet weather. Dense plant canopy and prolonged leaf wetness increase disease severity.

8. Ergot:

- **Symptoms:** Ergot infects jowar flowers and seeds, causing the development of elongated, dark purple to black sclerotia in place of seeds. Infected seeds may contain toxic alkaloids, posing health risks to humans and livestock.
- **Survival and Spread:** Ergot survives in soil and infected seeds as sclerotia. Spread occurs through wind, rain splash, and contaminated planting material.
- **Favorable Conditions:** Cool and moist conditions (15–20°C) during flowering and seed development stages favor ergot development. Overcrowded planting and poor seed quality increase disease incidence.

1.

Conclusion

In conclusion, jowar cultivation offers significant potential for sustainable food production, fodder supply, and economic development in diverse agro-ecosystems worldwide. By understanding the agronomy of jowar cultivation, farmers can adopt best practices to maximize yield, minimize risks, and enhance profitability. From seed selection to harvest, proper management of water, nutrients, pests, and diseases is essential for successful jowar production. By harnessing the resilience and adaptability of jowar crops, farmers can contribute to food security, livelihood improvement, and environmental sustainability in their communities.

References and Links

1. International Crops Research Institute for the Semi-Arid Tropics