Complete Process of Jowar Cultivation in India

1. Favorable Climate

- **Temperature**: Thrives best in temperatures **between 26°C and 33°C**.
- **Rainfall**: Requires **30–100 cm** of rainfall; excessive moisture can harm the crop.
- **Growing Season**:
  - **Kharif (June-July planting, October-November harvesting)** – requires moderate rainfall.
  - **Rabi (September-October planting, January-February harvesting)** – cultivated in low rainfall areas.
  - **Summer (January-February planting, May-June harvesting)** – requires irrigation support.

2. Suitable Soil

- **Best Soil Type**: Well-drained, **medium to deep black soil, sandy loam, or red soil**.
- **pH Range**: **6.0 to 7.5** is ideal.
- **Waterlogging**: Jowar is **drought-resistant** but sensitive to waterlogging.

3. Selection of Planting Material (Seeds)

- **Recommended Hybrid and Improved Varieties**:
  - **Kharif Varieties**: CSH-5, CSH-9, CSV-10, CSV-15
  - **Rabi Varieties**: M 35-1, CSV-216R
  - **Dual-Purpose (Grain + Fodder) Varieties**: CSH 13, CSH 16, SPV 462
- **Seed Rate**:
  - **Rainfed conditions**: **8–10 kg/ha**
  - **Irrigated conditions**: **12–15 kg/ha**
- **Seed Treatment**:
  - Treat with **Thiram or Captan (2 g/kg of seed)** to prevent fungal diseases.
  - Soak seeds in **1% Potassium Chloride solution** for 6 hours to improve germination.

4. Nursery Preparation

- Direct sowing is preferred; nursery raising is done only for **transplanting in high-yielding systems**.
- For nursery-based cultivation:
  - Use **raised beds** with well-decomposed organic manure.
  - Maintain **moist but not waterlogged soil conditions**.

5. Land Preparation

- **Plowing**: Deep plowing **twice** followed by harrowing.
- **Leveling**: Ensures uniform water distribution.
- **Soil Enrichment**: Apply **10-15 tons of FYM (Farmyard Manure) per hectare** before last plowing.

6. Sowing, Spacing, and Plant Population

- **Sowing Methods**:
    - **Broadcasting** (Traditional, uneven plant distribution).
    - **Line Sowing** (Recommended for better yield).
    - **Drilling** (Using seed drills for uniform depth).
- **Spacing**:
    - **Grain Purpose**: **45 cm × 12 cm** (ideal plant population of **1,85,000 plants/ha**).
    - **Fodder Purpose**: **30 cm × 10 cm** (higher plant density).
    - **High-Density Farming**: **22 cm × 5 cm** (for silage and biomass).

7. Root Dip Treatment (For Transplanting Systems)

- In cases where seedlings are raised in nurseries:
    - Dip roots in **Azospirillum biofertilizer** (to enhance nitrogen fixation).
    - Treat with **Bavistin (fungicide) at 0.2%** before planting.

8. Sowing/Transplanting Process

- **Best Time**:
    - Kharif: June-July
    - Rabi: September-October
    - Summer: January-February
- **Depth**: Sow at **2-4 cm depth**.
- **Water Management**: If rainfall is insufficient, apply **light irrigation immediately after sowing**.

9. Nutrient Management (Fertilization Schedule)

Growth Stage	Fertilizer Requirement (Per Hectare)
Before Sowing	10-15 tons FYM + 20 kg P_2O_5 + 40 kg K_2O
15-20 Days After Sowing	40 kg Nitrogen (Urea)
35-40 Days After Sowing	40 kg Nitrogen (Urea)

- **Micronutrient Spray**:
    - **Zinc sulfate (0.5%)** if zinc deficiency is observed.

- **Boron spray (0.2%)** improves grain quality.

10. Irrigation and Water Management

- **Critical Growth Stages for Irrigation**:
    1. Germination
    2. Flowering
    3. Grain Formation
- **Number of Irrigations**:
    1. **Rainfed crops**: 2-3 irrigations during drought.
    2. **Irrigated crops**: 5-6 irrigations, depending on soil type.
- **Water Conservation**:
    1. **Mulching** with crop residues helps retain moisture.
    2. **Intercropping** with legumes improves water-use efficiency.

11. Weed and Pest Management

- **Weed Control**:
    - **Pre-emergence herbicide**: Atrazine (0.5 kg/ha).
    - **Manual Weeding**: At 15 and 30 days after sowing.
- **Pests & Diseases**:
    - **Stem Borer**: Spray **Chlorantraniliprole (0.1%)**.
    - **Shoot Fly**: Apply **Carbofuran granules (5%)** in the soil.
    - **Grain Mold**: Spray **Mancozeb (0.3%)** during flowering.

12. Harvesting and Expected Yield

- **Maturity Duration**:
    - **Kharif Crop**: 100-120 days
    - **Rabi Crop**: 120-140 days
    - **Summer Crop**: 90-100 days
- **Signs of Maturity**:
    - Grains become **hard and glossy**.
    - Moisture content reduces to **20%**.
- **Yield per Hectare**:
    - **Rainfed conditions**: **15-20 quintals/ha**.
    - **Irrigated conditions**: **35-40 quintals/ha**.
    - **Fodder Yield**: **40-50 tons/ha**.

Financial Analysis of Jowar Cultivation in Maharashtra (Per Hectare)

1. Expected Cost of Cultivation

Input	Cost (Rs)
Land Preparation	6,000
Seed Cost (10-15 kg)	2,500
Fertilizers & FYM	8,000
Agrochemicals	3,500
Irrigation	5,000
Labor (Weeding, Harvesting)	10,000
Miscellaneous	5,000
Total Cost	**40,000**

2. Expected Income (Per Hectare)

Item	Details	Income (Rs)
Yield	**35 quintals (3500 kg)**	-
Market Rate	Rs **30/kg**	-
Total Income	**3500 × 30**	**1,05,000**

3. Profit Estimation

| Total Revenue | 1,05,000 |
| Total Cost | 40,000 |
| Net Profit | 65,000 |