A Whole Village Approach in SPSR Nellore District to introduce White Jowar Variety NTJ-5 that brought to Hope to Dryland Farmers

Background

The SPSR Nellore district of Andhra Pradesh, characterized by its dryland Vertisol agro-ecosystem, has faced increasing climatic challenges in recent years. Erratic rainfall patterns, terminal moisture stress, and susceptibility to cyclonic storms have severely impacted the productivity and profitability of *rabi* crops. Bengalgram, once the dominant *rabi* pulse in the region, exhibited poor performance due to rust incidence, late sowing challenges, and its sensitivity to both early-season floods and late-season drought. Consequently, farmers experienced yield instability, increased risk and reduced net income. This decline is reflected in a significant reduction in the area under Bengalgram cultivation from 11,833 hectares in 2018-19 to just 3,520 hectares by 2023-24 (Department of Agriculture, SPSR Nellore).

Simultaneously, Jowar cultivation in the region was constrained by the use of tall, lodging-prone, low-yielding local varieties and hybrids. These cultivars offered inconsistent yields, limited drought tolerance and substandard grain quality, making them less competitive in the market and less useful for dual-purpose grain-fodder needs. This scenario demanded the introduction of a short-duration, drought-resilient, high-yielding Jowar variety with strong market acceptance to improve farm-level resilience and incomes.

Plan, Implementation and Support

To address these issues, Krishi Vigyan Kendra (KVK), Nellore - I, implemented a Whole Village Approach to introduce the improved White Jowar variety, NTJ-5. The intervention strategy was designed to ensure widespread varietal adoption and capacity enhancement among farmers. The following steps were undertaken:

- **Frontline Demonstrations (FLDs):** NTJ-5 was demonstrated in real-time on farmer fields across selected villages to validate performance.
- **Capacity Building:** Hands-on training sessions, exposure visits and field days were conducted to enhance farmer's knowledge on improved agronomic practices, including sowing windows, nutrient management and pest control.
- **Input Facilitation:** Timely distribution of certified NTJ-5 seed ensured uniform crop establishment and optimal productivity.

- **Extension Support:** Farmers received continuous technical support through advisories, informational literature and field visits conducted by KVK.

Output of the model / process

The varietal intervention yielded significant improvements across key production and economic parameters:

- **Enhanced Yield:** NTJ-5 demonstrated superior performance in terms of grain and fodder yield compared to Bengalgram and traditional sorghum varieties and hybrids.
- **Resilience to Abiotic Stress:** The variety showed tolerance to drought and lodging, essential traits for dryland cultivation on Vertisols.
- **Market Acceptance:** Owing to its attractive grain characteristics, NTJ-5 garnered strong market preference, improving profitability.

Outcome of the model

The strategic introduction of NTJ-5 led to measurable benefits beyond the primary demonstration plots:

- **Horizontal Spread:** The technology diffused rapidly to neighbouring villages through farmer-to-farmer interaction and peer validation, setting the stage for large-scale adoption.
- **Economic Benefits:** The intervention resulted in increased farm income ranging between ₹14,383 to ₹21,928 per hectare, generating a cumulative additional return of ₹0.93 crore across 510 hectares, thereby underscoring the economic viability and climate resilience of NTJ-5 as a *rabi* crop alternative.
- **Input Optimization:** Farmers noted a reduced dependency on chemical inputs due to early maturity and stress tolerance of NTJ-5.
- **Improved Livelihood Security:** Enhanced fodder availability from NTJ-5 contributed to better livestock productivity adding secondary economic value to the cropping system.

Impact of the model

The intervention had tangible effects at the district level, marking a shift in cropping patterns and farm-level decision-making:

- **Agricultural Transformation:** The adoption of NTJ-5 led to improved cropping system resilience and diversification under rainfed conditions.
- **Income Enhancement:** Increased profitability empowered farmers to invest in education, farm infrastructure and household development.
- **Environmental Sustainability:** With its short duration and moisture-use efficiency, NTJ-5 proved more resilient to erratic rainfall and terminal drought.
- **Institutional Strengthening:** The success of the programme facilitated stronger linkages between farmers, KVK and input suppliers, laying the groundwork for sustainable dryland development.

Field demonstration of white jowar variety , NTJ-5

Field day of white jowar variety, NTJ-5