

Zero Tillage Maize Cultivation in Rice Fallows

A Resource-Conservation Technology

Introduction

In Srikakulam district, maize is the second major Rabi crop, cultivated in rice fallows over 5,314 hectares. While farmers traditionally grow green gram or black gram in these fallows, frequent outbreaks of Yellow Mosaic Virus (YMV) reduce pulse yields. Maize, being more remunerative and marketable, is increasingly preferred. However, conventional maize cultivation involves ploughing, raising costs and resource use. To address this, KVK, Srikakulam introduced and demonstrated Zero Tillage Maize—a cost-effective, resource-efficient technology suitable for rice fallow conditions.

Technology Overview: Zero Tillage Maize

- Sowing Method: No preparatory tillage required; sowing is done immediately after paddy harvest using residual moisture. Seeds are dibbled using peg or vijaya markers.
- Spacing: 60 cm × 20 cm
- Seed Rate: 8 kg/acre
- Seed Treatment: Mannose @ 3g/kg seed
- Labour Requirement: 2 persons/acre (3 hours)
- Weed Management: Atrazine @ 1 kg/acre + Paraquat @ 1 litre/acre within 48 hours of sowing
- Irrigation: 3–4 irrigations required; 2 irrigations saved vs. conventional method
- Fertilizer and Pest Management: As per normal maize practices

Advantages of Zero Tillage

- Reduces cost of cultivation by Rs. 2,500–3,000/acre
- Allows sowing 15–20 days earlier, boosting yields
- Enables an additional third crop (e.g., green gram or vegetables) in summer
- Saves two irrigations per crop
- Early harvest by one month, fetching higher market prices
- Protects crop from heavy April–May winds
- Ensures higher profitability and resource use efficiency

S.No	Particulars	Yield q/ha	Cost of cultivation Rs./ha	Gross returns Rs./ha	Increase in Net returns Rs.	B: C ratio
1	Zero tillage Maize	80.7	33300	98142	64842	2.93
2	Normal cultivation of Maize	75.5	33750	91450	53533	2.41

Benefits over conventional method:

- 7.3% yield increase

- Rs. 11,309/ha higher net returns
- Rs. 3,750/ha savings in field prep
- 5–10 days shorter crop duration
- 2 irrigations saved

Impact Analysis

Particulars	Unit	Area under Zero tillage Maize in (acres)	Savings and net returns for total area (Rs)
Savings on sowing and Field preparation per acre	Rs 1500	2500	37,50,000
Yield advantage /Acre	1.5 Q/acre @ Rs 1300 /q	2500	48,75,000
Savings on irrigation	2 Irrigations @ Rs580 saved per irrigation	2500	29,00,000
Total			1,15,25,000

Extension Strategies Adopted

A. Field-Level Interventions

- On-Farm Trials (OFTs) in 2012–13 and 2013–14 focused on technology validation and weed control
- Frontline Demonstrations (FLDs) from 2014–15 to 2016–17 across multiple villages
- Cluster FLDs under ATMA collaboration in 2015–16 and 2016–17
- Training programs and skill demonstrations in collaboration with the Department of Agriculture

B. Critical Inputs Supplied

- Maize seeds, herbicides, and plant protection chemicals provided to participating farmers

C. Knowledge Dissemination

- Developed and distributed Telugu literature titled “Vari Maagunulalo Dukki Dunnakunda Mokkaonna Saagu”
- Technical support provided to farmers and extension staff through seasonal field visits

D. Exposure Visits and Field Days

- Field days and farmer-scientist interfaces were held with support from ATMA and the Agriculture Department

Technology Promotion Partners

- KVK Srikakulam: Led OFTs, FLDs, and supplied inputs
- Department of Agriculture: Mobilized farmers and provided seed/maize shellers on subsidy
- ATMA: Funded large-scale demonstrations and training programs

Conclusion

Zero Tillage Maize is a proven, sustainable alternative for rice fallow regions. It reduces input costs, saves water, shortens crop duration, and increases profitability. With proper training and support, this resource-conserving technology can be scaled up across similar agro-ecological zones to enhance farmer income and climate resilience.