

PERFORMANCE ASSESSMENT OF RICE VARIETY MCM 103 IN SALINE SOILS OF WEST GODAVARI DISTRICT THROUGH FRONTLINE DEMONSTRATIONS

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ABSTRACT

The study was undertaken by Krishi Vigyan Kendra, Undi as a Front Line Demonstration (FLD) on rice MCM 103 variety in five locations during Kharif for two consecutive years during 2023 & 2024, to assess the performance of rice variety MCM 103 on yield and economics of rice. The higher yield i.e., 5273, 5062 kg/ha was noticed with MCM 103 rice variety compared to MTU 7029 (4959 and 4875 kg/ha) during both the years of assessment. Net returns and B:C ratio were higher with MCM 103 rice variety (Rs. 46414, 44446 and 45430/ha and 2.16, 2.35 and 2.25) when compared to farmers practice (Rs. 37480, 39105 and 38293 /ha and 1.8, 2.01 and 1.90) during 2023, 2024 and in pooled data, respectively.

Key words: Economics, FLD, Rice, Saline tolerant, Yield

INTRODUCTION

Rice is a staple food for more than 65% of Indians and accounts to 40% of total food grain production, thus making it essential to food and livelihood security. In India, rice crop occupies an area of 478 lakh ha with a production of 1378 lakh tons and productivity of 2882 kg/ha. Whereas in Andhra Pradesh, it grows in an area of 19.2 lakh ha with a production of 73.41 lakh tons and productivity of 3822 kg/ha (Ministry of Agriculture & Farmers Welfare, GOI, 2023-24).

Drought, salinity, and flooding cause serious harm beyond economic injury and agricultural losses annually (Akpeji *et al.*, 2021). However, salt stress has a significant impact on rice yield worldwide. Saline soils of India, Andhra Pradesh stands at 7th place with a share of 6.2% (Arora and Sharma, 2017).

In West Godavari district, paddy is the major crop grown during Kharif in an area of 84,891 ha, with a production and productivity of 4.2 lakh tons, 5002 kg/ha, respectively [Season & Crop Report, 2022-23]. One third of cultivable area in West Godavari district is affected by salinity.

Salinity is a major problem, especially in the Godavari delta area, because of land-use changes, aquaculture activities especially shrimp farming and seawater intrusion resulting in increasing salinity and impacting yields. Rice crop yield and quality is adversely effected by salinity during seedling and reproductive phases (Changappa *et al.*, 2024). Studies indicate that salt-tolerant rice varieties can mitigate yield losses,

There is every need to demonstrate the performance of new fine grain rice types that

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can withstand salinity. KVKs are the grassroot organizations designed to promote technology by evaluating, refining, and demonstrating tested technology in a district's micro farming situation.

Hence, KVK has conducted FLD with MCM 103 rice, a fine grain, salt tolerant, non lodging medium duration variety in farmers fields of West Godavari district. With this background, the present investigation was undertaken with the specific objectives of demonstrating the performance of MCM 103 rice for salt tolerance, grain yield and economic gains.

MATERIAL AND METHODS

Trial was conducted in 05 locations every year thus making a total of 10 demonstrations in farmers fields of Matsyapuri, Kuppanapudi, Utada and Dirusumarru, Kalla, Komatigunta, Tundurru villages. Each FLD plot was 0.4 ha with black soils. Existing farmers practice was traditional variety MTU 7029. While MCM 103 rice variety (Salt tolerant, fine grain, non lodging, good cooking quality, moderately resistant to blast, sheath blight and WBPH) was assessed in demo plot. A total of 10 farmers were selected based on soil testing reports and

their innovativeness in adopting latest technologies with the help of department officials and direct observation during field visits and interactive meetings. Trainings to selected farmers and group meetings were also organized on good agricultural practices in rice crop to provide the opportunities for other farmers to witness the benefits of demonstrated technology. The KVK Scientists visited the demonstrations plots and farmer's plot (control) on regular basis for close supervision and data collection during the entire programme. During two years, apart from yield data, economics were also recorded at the time of harvest. The data so recorded during two successive years was analyzed using descriptive statistics and ANOVA and the results were concluded at the respective levels of significance. pH and EC of demonstrated plots were mentioned in Table 1 & 2.

RESULTS AND DISCUSSION

Yield and yield attributes

MCM 103 rice variety recorded significantly higher yield i.e., 5273, 5062 kg/ha (Table 2) as compared to MTU 7029 variety (4959 and 4875 kg/ha) during Kharif, 2023 and 2024, respectively. The number of productive

Table 1. pH and EC in farmers fields of West Godavari district during Kharif 2023 & 2024.

| S.No. | Farmer Name | Village | pH | EC |
|-------|----------------------|-------------|------|------|
| 1 | V. Srinivasa rao | Kalla | 6.90 | 3.40 |
| 2 | K. Venkateswara Rao | Komatigunta | 7.25 | 3.98 |
| 3 | D. Jeevaratnam | Tundurru | 7.42 | 2.88 |
| 4 | R. Suryanarayana | Kalla | 7.26 | 3.89 |
| 5 | S. Venkateswara Rao | Kallakuru | 7.61 | 3.24 |
| 6 | K. Paparao | Utada | 7.47 | 3.48 |
| 7 | K. ChallaRao | Kuppanapudi | 7.76 | 4.83 |
| 8 | G.Santha Raju | Dirusumarru | 7.53 | 3.12 |
| 9 | Ch. Venkateswara Rao | Matsyapuri | 7.22 | 4.10 |
| 10 | K. Bhanu Prakash | Rustumbada | 7.26 | 3.42 |

Table 2. Performance of MCM 103 rice variety in farmers fields of West Godavari district during Kharif 2023 and 2024.

| Year | No. of productive tillers/hill | | No. of filled grains/panice | | Yield (Kg/ha) | | Net Returns (Rs./ha) | | B:C ratio | |
|-------------|--------------------------------|----------|-----------------------------|----------|--------------------|----------|----------------------|----------|-----------|----------|
| | MCM 103 | MTU 7029 | MCM 103 | MTU 7029 | MCM 103 | MTU 7029 | MCM 103 | MTU 7029 | MCM 103 | MTU 7029 |
| 2023 | 24 | 22 | 202 | 186 | 5273 | 4959 | 46414 | 37480 | 1.67 | 1.53 |
| 2024 | 22 | 20 | 248 | 232 | 5062 | 4875 | 44446 | 39105 | 1.61 | 1.53 |
| Pooled | 23 | 21 | 225 | 209 | 5168 | 4917 | 45430 | 38293 | 1.64 | 1.53 |
| | Yield | | | | Net returns | | | | | |
| Particulars | P Value | | F Value | | P Value | | F Value | | | |
| Varieties | 0.000931* | | 19 | | 0.001492* | | 19 | | | |

*indicates significant at 1 percent level

tillers, filled grains per panicle were also more with MCM 103 compared to Swarna. The growth and yield performance of MCM 103 variety was good under salinity level of more than 3.5 dSm⁻¹ compared to Swarna variety. The difference in yield might be due to the fact that genetic cause or responses of the particular genotype to the soil and might be reflected in yield attributes and yield of rice. The similar results were reported by Singh *et al.*, 2014, Samant, 2017 and Kumar *et al.*, 2023.

Net Returns and B: C ratio

The higher net returns (Rs. 46414, 44446 and 45430/ha) and Benefit Cost ratio (2.16, 2.35 and 2.25) were recorded with MCM 103 rice variety when compared to farmers practice (Rs. 37480, 39105 and 38293/ha; 1.8, 2.01 and 1.90) during 2023, 2024 and in pooled data, respectively (Bajadet *et al.*, 2017).

CONCLUSION

The study concluded that MCM 103 rice variety performed well in saline soils of West Godavari district in terms of yield, net returns

and high benefit-cost ratio than Swarna. Thus, it has potential to be promoted on large scale in salt affected regions of the district.

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