



Enhancing organic wheat productivity through land configuration and optimized nitrogen management in sub-humid Rajasthan

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Introduction

Global & National Importance: Wheat (*Triticum aestivum* L.) is a key global source of carbohydrates, protein, and calories. Wheat stands as a cornerstone of global agriculture, serving as a primary staple food for approximately 2.5 billion people across the globe.

Key Challenges: Intensive monocropping, imbalanced fertilization, low soil organic carbon, and micronutrient deficiencies are driving down soil health and factor productivity.

Organic Farming Limitations: Organic farming offers a sustainable solution, but adoption is hindered by initial yield drops and nutrient management difficulties.

Proposed Solution: Combining proper sowing methods with integrated nutrient management improves crop establishment, nutrient availability, soil moisture efficiency, and overall organic wheat yield.

Material and Methods



Treatments	Treatments details
Sowing methods	
S ₁	Flat row sowing
S ₂	FIRB method
S ₃	Zero tillage sowing
Nutrient management practices	
M ₁	100 % RDN through FYM as basal
M ₂	50 % RDN through FYM as basal + 50 % RDN with 1 st irrigation
M ₃	75 % RDN through FYM as basal + 25 % RDN with 1 st irrigation
M ₄	50 % RDN through FYM as basal + 25 % RDN with 1 st irrigation + 25 % RDN with 2 nd irrigation
M ₅	M ₁ + jeevamrit @ 500 L ha ⁻¹ at sowing and 1 st irrigation + panchagavya @ 5 % at booting stage
M ₆	M ₂ + jeevamrit @ 500 L ha ⁻¹ at sowing and 1 st irrigation + panchagavya @ 5 % at booting stage
M ₇	M ₃ + jeevamrit @ 500 L ha ⁻¹ at sowing and 1 st irrigation + panchagavya @ 5 % at booting stage
M ₈	M ₄ + jeevamrit @ 500 L ha ⁻¹ at sowing and 1 st irrigation + panchagavya @ 5 % at booting stage

Preparation and Application of Jeevamrut
(Natural Soil Fertilizer & Microbial Booster)

Ingredients

- Water: 200 litres
- Fresh desi cow dung: 10 kg
- Cow urine (old): 10 litres
- Jaggery: 2 kg
- Pulse flour: 2 kg
- Living soil (from beneath banyan tree): ~100 g

Preparation Steps

- Fill a barrel with 200 litres of water.
- Add all ingredients and stir well.
- Keep it in shade for 48 hours to ferment.

Jeevamrut is ready for use.

Application

Applied at:

- Sowing: 500 L ha⁻¹
- 1st Irrigation: 500 L ha⁻¹

Nutrient content (Table 2)

	N	P	K
1.84 – 1.97%	0.19 – 0.20%	0.20 – 0.29%	

Jeevamrut enhances soil health, provides essential nutrients and promotes beneficial microbial activity.

Preparation and Application of Panchagavya
(Growth Promoter & Plant Nutrient)

Ingredients

- Fresh cow dung: 5 kg
- Cow ghee: 1 kg
- Cow urine: 3 litres
- Cow milk: 3 litres

Preparation Steps

- First mix 5 kg cow dung and 1 kg cow ghee thoroughly and keep it for 3 days.
- Mix twice daily (morning/evening) at least for 15 minutes.
- Cow curd: 2 kg
- Jaggery: 500 g
- Mix cow urine (3 L), cow milk (3 L) and jaggery (500 g). Mix thoroughly.
- Keep for 15 days with regular mixing (morning & evening).
- Filter through fine cloth.

Panchagavya stock solution is ready.

Application

Applied at:

- Booting stage: 5% spray

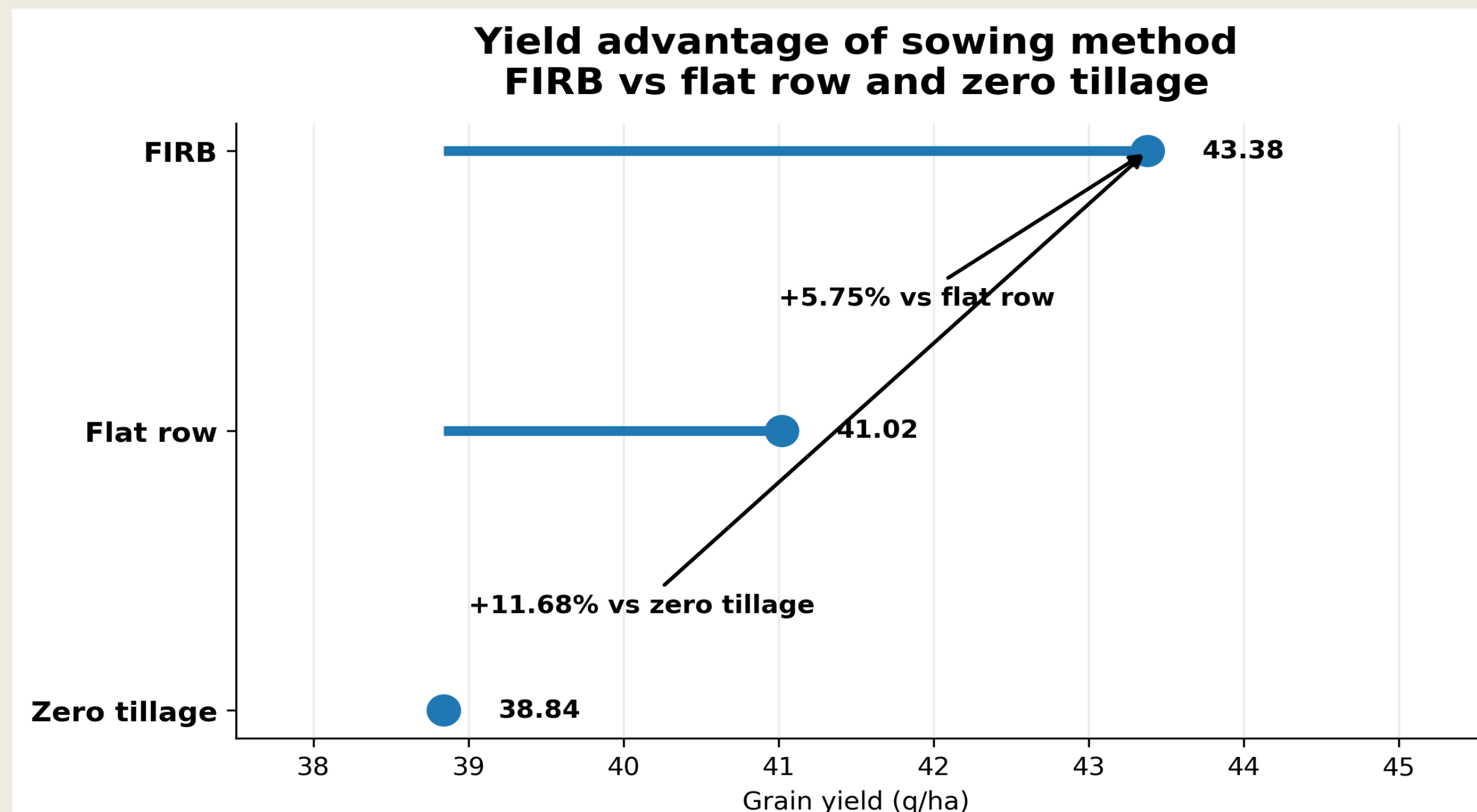
Nutrient content (Table 2)

	N	P	K
0.44%	0.41%	0.99%	

Panchagavya promotes plant growth, enhances nutrient uptake and improves stress tolerance.

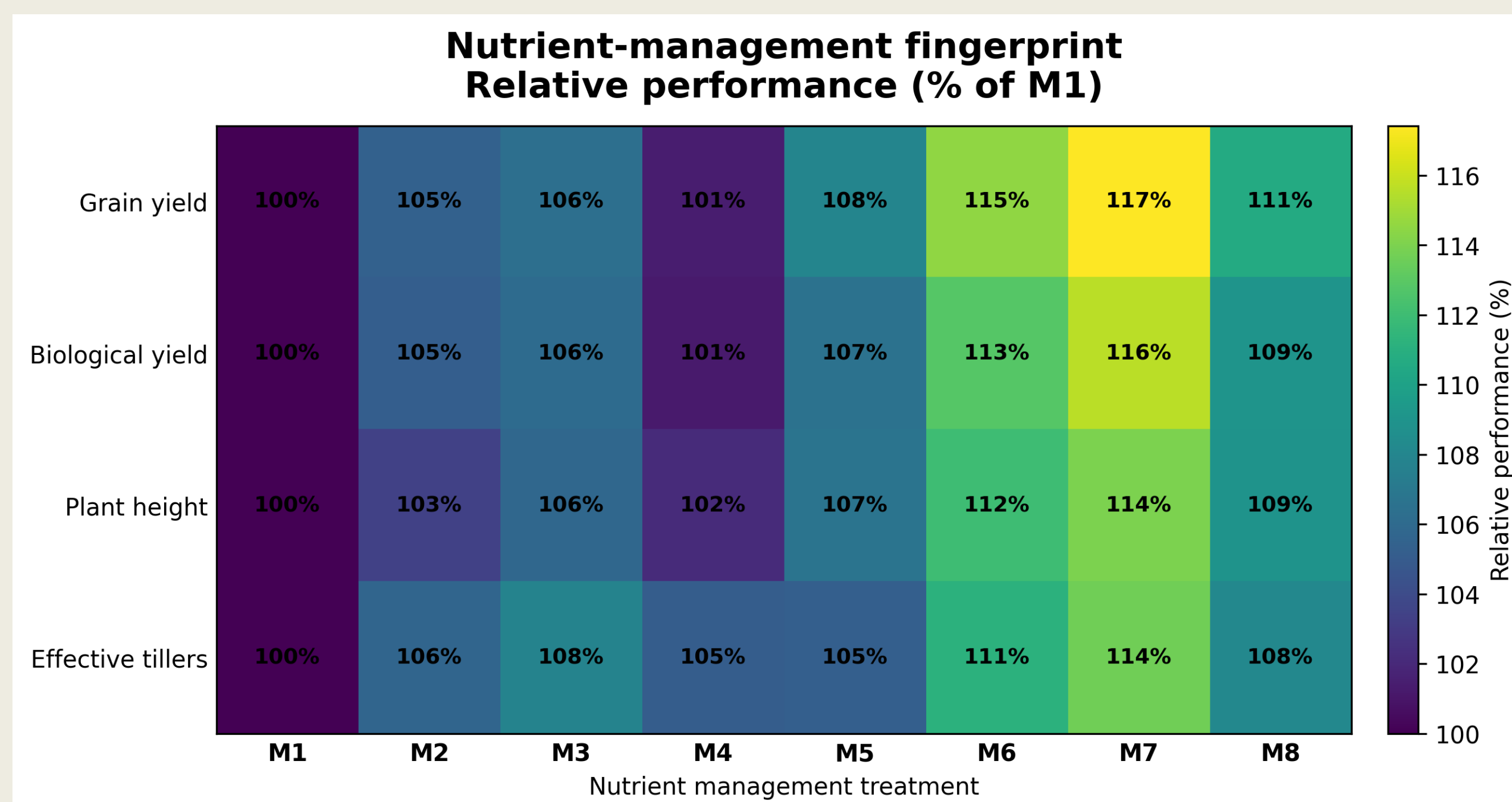


Results



✓FIRB increased grain yield 5.75 per cent over flat row and 11.68 per cent over zero tillage.

✓FIRB recorded highest biological yield and effective tillers.



Split application of RDN through FYM with jeevamrit and panchagavya, treatment M7 (75% RDN through FYM as basal + 25% RDN with 1st irrigation with jeevamrit @500 litre/ha at sowing and first irrigation + panchagavya @5% at booting stage) registered significantly higher grain yield (44.68 q/ha).

Conclusion

