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Synergetic Effect of Jeevamrit and Arbuscular Mycorrhizal Fungi (AMF) on Papaya Orchard

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Papaya (*Carica papaya* L.) is one of the most economically important tropical fruit crop grown worldwide, renowned for its rich nutritional content, including vitamins A, C, and E, antioxidants and digestive enzymes such as papain. Papaya, a native of Mexico, is a major fruit crop in both tropical and subtropical regions. The global papaya production is estimated to be approximately 13.82 million tonnes and cultivated across an area of 5.03 Lakh ha. India is the largest producer of papaya, contributing 38.35 per cent of the global papaya production, amounting to 5.30 million tonnes, cultivated across 1.50 Lakh ha. Leading papaya producing states are Gujarat, Andhra Pradesh, Madhya Pradesh, Maharashtra, Karnataka, Chhattisgarh and Bihar. Jeevamrit (a fermented organic microbial culture made from cow dung, cow urine, jaggery, pulse flour and soil) is widely used in natural/organic farming. In a papaya orchard, its effects are mainly on soil health, nutrient availability, and plant vigor, rather than acting like a direct fertilizer. AMF are beneficial soil fungi that form a symbiotic association with papaya roots. Papaya responds very well to AMF, especially in phosphorus-deficient, light, or organic soils.The combined use of Jeevamrit and AMF (Arbuscular Mycorrhizal Fungi) works very well in a papaya orchard, because both support the plant in different but complementary ways Jeevamrit boosts soil microbes, while AMF directly improves root nutrient uptake.

Strong Root Development

- AMF forms a symbiotic association with papaya roots
- Extends root surface area through fungal hyphae
- Jeevamrit supplies food (carbon source) that helps AMF and other microbes multiply
- Result: stronger, healthier root system

Improved Nutrient Uptake (Major Benefit)

- AMF significantly enhances uptake of:
- Phosphorus, Zinc, Iron, Copper, Manganese
- Improves nitrogen efficiency indirectly
- Jeevamrit helps convert locked nutrients into available forms
- Together, they increase nutrient use efficiency, especially in low-fertility soils.

Papaya plants show better nutrient balance even with reduced fertilizer use.

Papaya Orchard

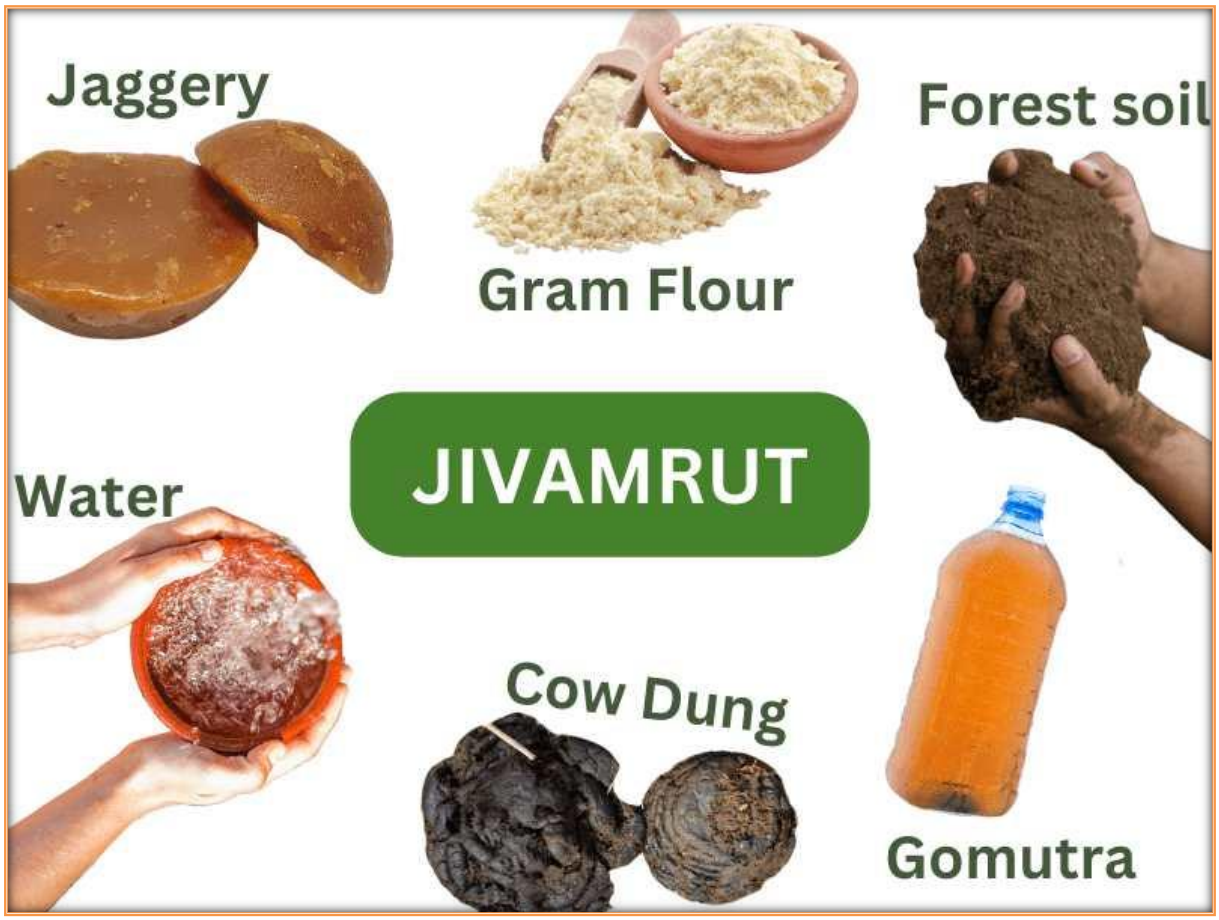
Better Plant Growth and Vigor

Increased:

- Plant height
- Stem girth
- Leaf number and leaf area
- Plants show dark green foliage
- Particularly useful during early growth stage of papaya
- Promotes:

✓ Stronger stem and leaf development
✓ Better canopy growth
✓ Healthier root system

Leads to uniform plant growth when applied regularly.



Increased Flowering, Fruit Set, Fruit Quality & Yield □

- Healthy nutrition leads to:

✓ Early flowering
✓ Reduced flower and fruit drop
✓ Higher fruit set percentage

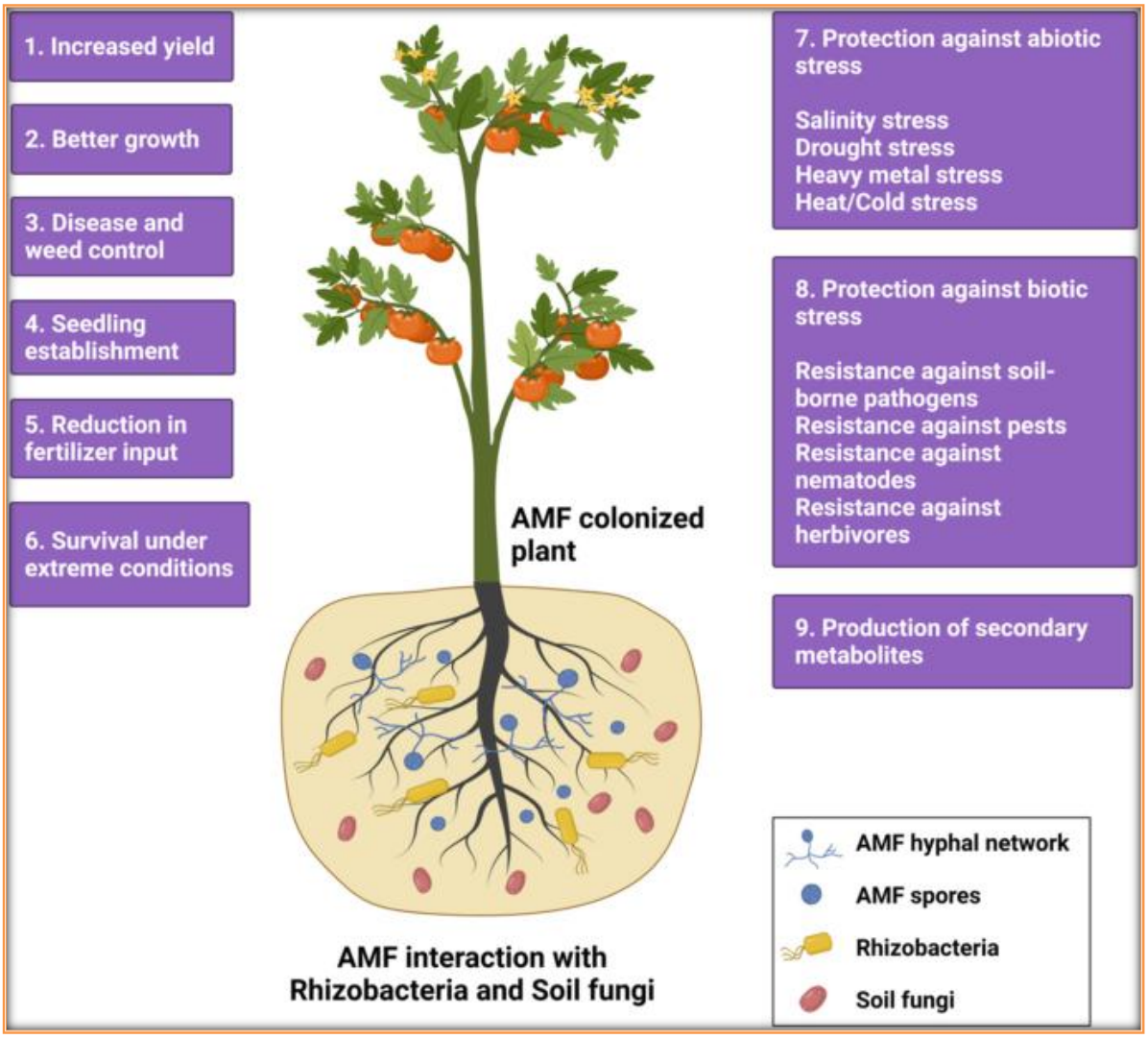
- Fruits become:

✓ Larger in size
✓ More uniform
✓ Better sweetness (higher TSS)

Leads to higher number of fruits per plant

Fruits tend to have:

✓ Better size and uniformity
✓ Improved sweetness (TSS)
✓ Longer shelf life
✓ Yield improvement is gradual, not immediate



Improved Tolerance to Stress

- AMF improves:
✓ Drought tolerance
✓ Resistance to nutrient stress
- Jeevamrit improves soil moisture retention and microbial balance
- Plants perform better under heat and water stress.

Enhanced Vegetative Growth

- Increased:
✓ Plant height
✓ Stem girth
✓ Leaf number and leaf area
- Leaves become dark green and healthier
- Growth is more uniform across the orchard

Reduced Soil-borne Diseases (Indirect Effect)

- AMF competes with harmful pathogens in root zone
- Jeevamrit increases beneficial microbes that suppress disease-causing organisms
- Helps reduce:
✓ Root rot
✓ Wilt incidence

Disease Suppression

- Strong soil microbial population helps suppress soil-borne diseases
- Improves plant immunity but does not replace plant protection measures

Application Method in Papaya Orchard

AMF Application :

Best Time: At Transplanting

- Dose: 10–20 g AMF inoculum per plant
- Place inoculum in planting pit near roots
- Mix with compost/FYM for better colonization

Existing Orchard

- Apply in root zone (5–10 cm deep) mixed with organic manure
- Irrigate immediately after application

Important Precautions □□

- Avoid heavy chemical fungicides near AMF application
- Avoid excessive phosphorus fertilizers
- Maintain proper soil moisture
- AMF takes 2–4 weeks to establish

Jeevamrit Application :

- Soil drench / irrigation

✓ 200–500 liters per acre

✓ Every 15–30 days

- Can be applied through drip (well-filtered)

Important:

- Do not apply chemical fungicides near AMF application time
- Maintain soil moisture for AMF establishment

Best Results When Combined With:

- FYM / compost / vermicompost
- Mulching
- Reduced chemical fertilizer use (especially phosphorus)

Conclusion

- Improves soil biology and root efficiency
- Enhances nutrient uptake and plant vigor
- Reduces dependency on chemical fertilizers
- Improves soil fertility naturally
- Enhances plant health and productivity
- Supports sustainable, low-cost farming and organic papaya production
- Enhances growth, yield and fruit quality

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