

Ginger Production and Productivity in Karnataka: Current Status, Major Constraints and Sustainable Strategies for Enhancement

Pooja G. K¹. and Pavithra R².

¹Senior Research Fellow, Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences, Shivamogga

²Research Associate, Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences, Shivamogga, India

SUMMARY

Ginger (*Zingiber officinale* Rosc.) is an economically important commercial spice crop in India and contributes substantially to farm income through its culinary, medicinal and processing uses. Karnataka is one of the major ginger-producing states, with substantial cultivation concentrated in districts such as Shivamogga, Chikkamagaluru, Uttara Kannada, Kodagu and Hassan. Despite expansion in cultivation area and increasing market demand, ginger productivity has become increasingly unstable in recent years due to the combined effects of biotic, abiotic and socio-economic constraints. The major factors responsible for declining yield include the use of poor-quality and infected seed rhizomes, soil degradation and nutrient deficiencies, erratic rainfall, drought and water logging, rhizome rot and soft rot diseases, emerging fungal diseases, inadequate drainage and crop management, continuous mono-cropping, post-harvest losses and market price fluctuations. Sustainable enhancement of ginger production requires an integrated approach involving the use of disease-free quality planting material and improved varieties, integrated nutrient management based on soil testing, application of organic manures and bio-fertilizers, efficient soil and water management, raised-bed cultivation, mulching, crop rotation and integrated disease management using *Trichoderma* and *Pseudomonas* based bioagents. Scientific curing, storage and value addition can further reduce the post-harvest losses and improve farmer's returns. Strengthening farmer capacity through training, demonstrations, farm trials and timely technical advisories is also essential. Adoption of these climate-resilient and sustainable production practices can reduce yield risks, enhance productivity and profitability, improve resource-use efficiency and ensure the long-term sustainability of ginger cultivation in Karnataka.

INTRODUCTION

Ginger (*Zingiber officinale* Rosc.) is one of the important commercial spice crops cultivated in India and contributes significantly to farm income owing to its high demand for culinary, medicinal and processing purposes. India is one of the leading producers of ginger globally. According to the Spices Board of India, ginger was cultivated in an area of 1.94 lakh ha with a production of 23.33 lakh tonnes during 2023-24, while the area and production during 2024-25 were estimated at 1.93 lakh ha and 22.46 lakh tonnes, respectively (Spice Board, India 2025). Karnataka is one of the major ginger-producing states of India, with ginger cultivation concentrated in districts including Uttara Kannada, Hassan, Shivamogga, Chikkamagaluru, Kodagu, Udupi and Mysuru. Recent data indicate that Karnataka recorded 21,344 ha under ginger cultivation with a production of 2.33 lakh tonnes during 2023-24, while the corresponding figures for 2024-25 were 22,704 ha and 2.40 lakh tonnes, respectively (Gali and Reddy, 2025). Despite its economic importance, ginger cultivation is subject to considerable fluctuations in productivity owing to various biotic, abiotic and socio-economic factors, which can adversely affect production and farm profitability.



Current status of ginger yield and productivity in Karnataka

The area under ginger cultivation in Karnataka has generally increased over the past two decades due to favorable prices and rising demand. Studies indicate that, overall production growth has been positive, with production registering an annual growth rate of around 11 percent during the long-term period. However, productivity gains have not been consistent and significant instability in yield and production has been observed, particularly after 2020. Yield fluctuations are common across years due to disease outbreaks, weather variability and market uncertainties. Recent reports from major ginger-growing districts indicate substantial yield losses due to rhizome rot, bacterial wilt, emerging fungal diseases and climatic conditions.

Problems faced by farmers in ginger production

- Expansion of cultivation area but unstable productivity.
- Continued dependence on traditional varieties such as Rio-de-Janeiro and Himagiri.
- Increasing incidence of soil-borne diseases.
- Declining soil health due to continuous mono-cropping.
- Growing market volatility affecting profitability.
- Emergence and outbreak of new diseases



Important diseases of Ginger

Major reasons for declining productivity and yield

1. Use of poor-quality seed material

Many farmers continue to use farm-saved seed rhizomes without proper selection and treatment. The use of infected planting material facilitates the spread of diseases and lowers crop vigour.

2. Nutrient deficiencies and soil degradation

Continuous cultivation with excessive dependence on chemical fertilizers has resulted in micronutrient deficiencies and deterioration of soil health. Deficiencies of zinc, boron and magnesium negatively affect rhizome development and yield.

3. Climate variability

Erratic rainfall patterns over the past five years, prolonged dry spells and excessive moisture conditions have become increasingly common. Water-logging during heavy rains and moisture stress during dry periods adversely affect crop growth and increase disease incidence.

4. Disease outbreak (rhizome rot and soft rot diseases)

Rhizome rot complex, commonly referred to as soft rot, is one of the most destructive and economically important diseases of ginger in Karnataka. The disease is associated with a complex of soil and planting material borne pathogens, including *Pythium aphanidermatum*, *Ralstonia solanacearum*, *Fusarium solani*, *Sclerotium rolfsii* and *Meloidogyne incognita* (Tejas *et al.*, 2023). Poor drainage, use of infected or improper planting material, continuous monocropping and lack of crop rotation are important factors contributing to the higher occurrence and spread of the disease in ginger-growing areas of Karnataka (Mahesha *et al.*, 2020). Under conducive environmental conditions, rhizome rot can cause severe yield losses of 50-90%, thereby posing a major constraint to ginger production.

5. Emerging fungal diseases

ICAR–Indian Institute of Spices Research (IISR) Calicut and KSNUAHS, Shivamogga recently reported a new fungal disease caused by *Pyricularia* spp. in Kodagu district. The disease causes premature yellowing and drying of foliage, resulting in poor rhizome development and significant yield reduction.

6. Inadequate crop management

Poor drainage, improper spacing, inadequate mulching and lack of crop rotation contribute significantly to productivity decline. Many farmers continue mono-cropping, resulting in the build-up of soil-borne pathogens.

7. Post-harvest and storage losses

Storage losses of ginger can range from 10-30 percent due to rotting, sprouting, desiccation and microbial infections. Lack of scientific storage facilities like improper handling and storage techniques result in considerable quantitative and qualitative losses. Rhizomes stored under improper temperature and humidity conditions suffer deterioration in quality and market value.

8. Economic and market constraints

Farmers face severe price fluctuations. Recent reports from Karnataka indicate drastic reductions in market prices coupled with disease-induced crop losses, reducing profitability and discouraging investment in improved technologies.

Recommended sustainable measures to improve ginger production and productivity

1. Use disease-free seed rhizomes

Select healthy, certified seed rhizomes from ICAR institutes. Treat seed rhizomes with recommended bioagents such as *Trichoderma harzianum* before planting. Avoid using seed from disease-affected fields.

2. Adoption of improved varieties

ICAR-IISR recommends cultivation of improved varieties with better yield potential and disease tolerance, including: IISR Rejatha, IISR Mahima, Himagiri, Suprabha and Varada. These varieties exhibit superior yield, quality and adaptability under diverse growing conditions.



3. Integrated nutrient management (INM)

- Application of well-decomposed FYM at 25-30 t/ha.
- Use of vermicompost and biofertilizers.
- Balanced NPK application based on soil testing.
- Adopting technology of Ginger Special micronutrient which has been endorsed by KSNUAHS, Shivamogga by conducting experiments, farm trails and demonstrations has shown improvements in yield and profitability. Hence, foliar application of Ginger Special micronutrient formulation to correct nutrient deficiencies and improve productivity.

4. Soil and water conservation

- Construct raised beds and drainage channels.
- Adopt mulching with green leaves and paddy straw to conserve moisture.
- Implement drip irrigation for efficient water use.
- Avoid water-logging during monsoon periods.



5. Crop rotation and diversification

A minimum 2–3 year rotation with cereals, legumes, or vegetables is recommended to reduce disease inoculum and improve soil fertility.

6. Integrated disease management

- Raising crops on well-drained raised beds.
- Application of *Trichoderma* enriched compost.
- Soil solarization where feasible.
- Removal and destruction of infected plants.
- Crop rotation with non-host crops.
- Avoiding continuous ginger cultivation in the same field.

7. Biological and Organic Approaches

- Use *Pseudomonas fluorescens* and *Trichoderma* bioagents.
- Increase organic matter through compost and green manures.
- Encourage integrated pest and disease management (IPDM).

8. Scientific post-harvest management

- Cure rhizomes properly before storage.
- Store seed rhizomes in well-ventilated structures.
- Maintain suitable temperature and humidity.
- Promote value addition through ginger powder, dry ginger, candy and oleoresin production.

9. Capacity building and advisory programmes

- Strengthen capacity development programmes through various extension agencies.
- University KSNUAHS, Shivamogga conducted various training programmes, demonstrations and farm trails on ginger production aspects.
- Still more research and extension efforts are required to cater the needs of the farmers.

CONCLUSION

Ginger remains an economically important spice crop in Karnataka, but productivity growth has become increasingly unstable due to disease outbreaks, climate variability, poor-quality seed material, nutrient deficiencies and market fluctuations. Rhizome rot continues to be the major biological constraint, while newly emerging diseases pose additional challenges. Sustainable improvement in ginger production requires integrated disease management, use of improved varieties, balanced nutrient management, quality seed production and scientific post-harvest handling. By implementing these measures, Karnataka can enhance ginger productivity, reduce production risks, improve profitability and ensure long-term sustainability of the ginger sector.

REFERENCES

- Gali, R. and Reddy, M. T. (2025). Growth, instability and sources of output growth of ginger in Karnataka - An analysis. *Journal of Spices and Aromatic Crops*.
- Mahesha, H. S., Ravikumar, M. R., Suryanarayana, V., Prabhu, S. T. and Jagadeesh, B. R. (2020). Status of ginger rhizome rot complex disease in major growing tracts of Karnataka. *International Journal of Ecology and Environmental Sciences*, 2(4): 769-774.
- Spices Board India. (2025). Annual Report 2024-25. *Ministry of Commerce & Industry*, Government of India.
- Tejas, K., Ravikumar, M. K., Lokesh, M. R. and Ganpathi, T. (2023). Prevalence of rhizome rot complex in major ginger growing regions of Karnataka. *Journal of Farm Sciences*, 36(1): 50-52.