# **Bioorganic for control of Softrot of Ginger**

**Head :** Diagnostics, Vaccines and Biotechnological Products **Technology Profile for Bioorganic for control of Softrot of Ginger** 

1	Name of the Institution	ICAR Research Complex for NEH Region
2	Address	Umroi Road, Umiam – 793103, Meghalaya
3	Name of P.I & Co.P.I	Dr. RAJESH KUMAR
4	Description of technology	Herbal formulation for controlling softrot of
		Ginger
5	Flow chart of technology / process	_
6	Area of application:	
7	Patent number & Date of filing	N/A
8	If patent is not filed, mentioned in which	2007
	year the technology was developed?	
9	Did any entrepreneur has shown interest	Enclosed
	on this technology? If yes, please provide	
	the name, address of the entrepreneur	
10	Equipment required	Autoclave, Boiler, Grinder, Chopper, Bottle
		sealing machine
11	Space requirement	3000 Sq.feet
12	Plant set up cost	Rs. 50 lakhs
13	Raw material and production cost	Rs 100 / liter of formulation
14	Risks / opportunities involved in adopting	The technology is suitable for both organic
	the technology	and conventional agriculture, potential to
		generate employment for local farmer.
15	Cost of available alternate technologies to	None
	similar products	
16	Expected cost of technology	Rs 150 – 200 / liter
17	Details of benefits of the technology /	
	process developed	
18	Any suggestion from Project leader for	Kindly refer to Point No. 14
	commercialization this technology	

#### **Procedures**

- Mix the formulation at a rate 20 ml per liter of water.
- Treats mother rhizomes for 10-12 hrs. in solution before sowing. The same solution can be used for 2<sup>nd</sup> and 3<sup>rd</sup> lots of ginger rhizomes. Discard the leftout solution after 30-36 hrs. Normally for one liter of solution one kg of planting material can be treated.
- If the rhizome is not treated at the time of planting, still the formulation can be used by way of soil drenching by applying around the plant base. 60-70 ml of ready solution should be applied to individual plant.
- Avoid rainy days as for effective results 10-12 hrs of dry spell is needed.
- The formulation is currently recommended for ginger crop only. Therefore it should not be applied to any other crops.

### **Precautions**

- Once the bottle uncorked, use whole content.
- The product is natural & safe for human skin, however, avoid prolong contact.
- The formulation is made with plant extracts without adding any chemicals. Therefore it can be used for organic ginger cultivation.

### Performance

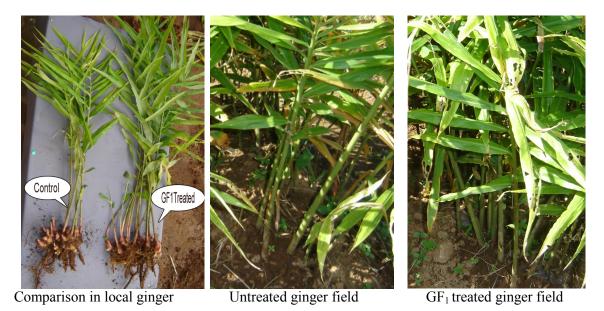
**Early sprouting:** Treated rhizome responded very well and under field condition juvenile sprouts emerged 10-12 days ahead as compare to non-treated (control) rhizome



Non-treated ginger rhizome

GF<sub>1</sub> treated ginger rhizome

**More pseudostems**: GF<sub>1</sub> treated ginger had significantly higher number of pseudostems. Normally 30-40% more number of pseudostems appears in treated crop field



**Higher biomass**: After 70 days of sowing GF<sub>1</sub> treated ginger accumulate more than 30 % biomass as compare to without treated crop





Untreated crop

GF<sub>1</sub> treated ginger

**Higher root growth**:  $GF_1$  treated ginger generate much higher root growth. Normally treated rhizomes have 55-60% more root growth. Length of the root increased by 20-25% in bioorganic

treated ginger





Root in GF<sub>1</sub> treated ginger

Root in untreated ginger

**Soft rot disease scoring:** Rhizome treated (10-12 hrs) before sowing performed far superior than untreated crop. 90 % of  $GF_1$  crop had no symptom of soft rot and the plant where having lustrous green leaves. Whereas, in untreated crop 28-45% of plants where affected by the disease. In soil drenching with  $GF_1$  also performed better and only 15% of plants affected by the disease.





GF<sub>1</sub> treated ginger

Untreated crop

**Yield advantage:** GF<sub>1</sub> treated ginger had significantly higher yield (30-35%) over untreated crop. The rhizomes harvested out are better and having shining scales as compare to non-treated crop. Overall ginger growers could be greatly benefited by the formulation





Formulations ready for distribution

Scientist interacting with farmers

### Ginger cultivation with bioorganic (GF<sub>1</sub>) formulation

## Productivity in farmers' fields

Average yield: 10-12 t ha<sup>-1</sup>

Average selling price: Rs 10 /kg

Average cost of production: Rs 27,000 Average net income: 73,000-95,000

## Productivity of ginger with help of bioorganic (GF<sub>1</sub>) treatment

Average yield: 13-15 t ha<sup>-1</sup>

Average selling price: Rs 10/kg

Average cost of production: Rs 28,500 Average net income: 1,0,1500-1,2,1500

Cost of bioorganic: Rs. 150 / liter

Bioorganic/ha: 10 liters