Bio control:: Mass production

Preparation of Talc based products, Air drying of formulation and Estimation of Moisture content

Flowchart

a)*Tichoderma viride*

The fungal biomass collected from fermentor is mixed with talc powder at 1:2 ratio. The mixture is air dried in shade and mixed with carboxy methyl cellulose (CMC) @ 5 g / kg the product. It is packed in polythene bags and should be used within 4 months.

Quality control parameters:

1. Fresh product should contain hot less than 28 x 106 cfu / g
2. After 4 months of storage at room temperature, the population should be 20 x 106 cfu / g.
3. Maximum storage period in talc is 4 months.
4. The talc size should be 500 microns
5. The product should be packed in polythene bags
6. Moisture content of the final product should not be more than 20%

b) *Bacillus subtilis*

The broth containing the bacteria is collected from fermentors and mixed with 250 kgs of sterilized neat soil for 100 lit of broth. Then 37 kgs if calcium carbonate is added thoroughly mixed, dried is shade and packed in polythene bags. This can be stored upto 6 months.

C. *Pseudomones fluorescens*

The broth containing the bacterial growth is collected from fermentor and added @ 400 ml / kg of talc powder. Then CMC is added @ 5 g /kg mixed well air dried to 20% moisture level and packed in polythene bags.

Quality control parameters:

1. Fresh produce should contain 2.5 x 108 cfu/g
2. After 3 months of storage at room temperature the population should be 8-9 x 107 cfu/g
3. Storage period is 3-4 months
4. Minimum population load should be 1.0 x108 cfu /g
5. Moisture content should not exceed 20% in the final product
6. Population per ml of the broth should be 2 x 108 cfu /g

Crop	Pathogen	PGPR	Reference
Rice	*R. solani*	*P. fluorescens*	Radjacommare *et al.*, 2002
	P. grisea		Nandakumar *et al.*, 2001
Hot pepper and Tomato	*Pythium spp*	*P. fluorescens*	Ramamoorthy *et al.*, 2002a
Tomato	*F. oxysporum f.sp. lycopersici*		Ramamoorthy *et al.*, 2002b
Chilli	*Colletotrichum capsici*	*P. fluorescens*	Bharathi *et al.*, 2004
		B. subtilis	
Grape vine	*Botrytis cinerea*	*Pseudomonas* sp	Barka *et al.*, 2002
Tomato	Tomato spotted wilt virus	*P. fluorescens*	Kandan *et al.*, 2002
Mango	*C. gloeosporoides*	*P. fluorescens*	Vivekanandan *et al.*, 2004
		B. subtilis	

Crop	Pathogen	PGPR	Reference
Carnation and Flax	*Fusarium* sp	*P. putida*	Duijff *et al.*, 1999
Radish	*Fusarium* sp	*P. putida*	Boer *et al.*, 2003
Wheat	*Gaeumannomyces graminis* var. *tritici*	*Pseudomonas* sp	Duffy and Weller., 1995
Radish, Arabidopsis	*F. oxysporum* f.sp. *raphani*	*P. fluorescens*	Pieterse *et al.*, 1996
Radish	*F. oxysporum* f.sp. *raphani*	*P. fluorescens*	Leeman *et al.*, 1995
Sugarcane	*Colletotrichum falcatum*	*Pseudomonas* sp	Viswanathan and Samiyappan, 2001
Ragi	*Pyricularia grisea*	*P. fluorescens*	Radjacommare *et al.*, 2004