A SUITABLE MEDIUM FOR THE PRODUCTION OF Rhizoctonia solani INOCULUM FOR FIELD INOCULATION.

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For the study of different aspects of sheath blight disease caused by Rhizoctonia solani artificial method of inoculation is necessary. The present practice is to grow the fungal colony on Potato Dextrose Agar (PDA) plates and to inoculate the leaf sheaths by placing agar blocks from the plates within the sheath. This method is very practical for lab. and greenhouse studies. However, in the field it is both cumbersome and time consuming. This study was undertaken to test for more suitable method of inoculum production.

Materials and Methods:

1. Comparison of media for Rhizoctonia solani growth.

Several inexpensive and readily available raw materials such as rice chaff, rice straw, rice dust, rice husk, rice grains, saw dust were used individually as well as in combination of media for growing Rhizoctonia solani. 5 g. of each of these or mixtures were placed with 15 ml. of distilled water in glass petridishes and were autoclaved at 15 psi. 121 C^{o} for 15 minutes. These plates and plates of potato dextrose agar (PDA) and water agar (WA) as check were then inoculated with a single sclerotium of R. solani from one of its fast growing cultures. The sclerotium was placed at the centre of the petridish and the colony growth was measured by taking its surface diameter.

The same media were tested in 250ml. conical flasks too by mixing 15 g. of the raw materials with 45 ml. distilled water and auctoclaving as before. A single sclerotium of R. solani was inoculated and the number of sclerotia formed at the end of 30 days was counted. In this experiment too, PDA and WA were used as checks. Each media was replicated three times.

Following were the media tested:-

Rice chaff
Rice straw
Rice husk
Rice grain
1.1., Rice chaff + grain
Rice chaff + agar
Rice dust
Saw dust
Water agar (WA)
Potato dextrose agar (PDA)

2. Comparison of the rate of disease development in two media.

From the results of the first experiment the most suitable medium was selected and it was compared with potato dextrose agar medium for the rate of disease development.

Potted plants were used for this experiment. Equal amounts of the media were placed within the sheaths of the rice plants and this was compared by spreading equal amounts of the medium on the water surface around the plant. The time taken to produce symptoms was noted in each of the treatments which were replicated three times.

Results:

Initially growth of the fungus was very fast in PDA and water agar media. (Table 1). But mycelial density was very low in the water agar medium. After 48 hours growth in PDA and grain medium was not significantly different. Growth on chaff + grain mixture, agar + chaff, chaff, rice dust, straw media was moderate, but very low on saw dust and husk.

The highest number of sclerotia were produced in grain medium. (Table -2) It had produced more than 3000 sclerotia. The chaff + grain mixture produced 490 sclerotia. Sclerotia production was lso very low in husk, straw and saw dust media.

Disease development rate was dependant on the method of inoculation but not on the media. When m dium was placed within the sheath 4 days were taken to produce symptoms. When the medium was spread on the water surface symptoms appeared after 6 days of inoculation.

Discussion:

There was no significant differences of the mycelial growth between grain and PDA medium. But grain medium could produce larger number of sclerotia than PDA This is because organism could grow only on upper surface of the PDA medium. But more space and growing surface were available in grain medium and it could therefore produce more sclerotia.

However, medium appeared to have no effect on disease development. But placing the medium within the sheath was more effective than being spread on the water surface. In our field inoculations spreading the medium on the water surface was convenient than placing medium within each and every sheath.

A medium which can produce large number of sclerotia and also easily spread out on the water surface is required for field inoculation. Using this medium was very convenient as well as very effective in getting disease incidence. Further the raw material required and the preparation of the medium does not cost very much nor is it necessary to use sophisticated equipments. Due to these reasons this medium of rice grain can be considered to be the most suitable for growing and inoculating Rhizoctonia solani in the field.

Table 1. - Growth of Rhizocionia solani on different media.

Media.	** Colony diameter (mm)			
	After 24 hrs.	After 48 hrs	After 72 hrs.	After 96 hrs.
Chaff	11.3	35.5	84.0	84.3.
Straw	10.0	26.0	33.0	68.3
water agar	33.0	57.5	86.0	86.0*
Husk	8.6	16.0	74.6	84.0
Saw dust	7.3	11.3	12.6	13.8
Grain	16.6	86.0	86.0*	86.0*
Chaff+grain	14.3	37.6	84.0*	84.0*
P D A	25.5	85.0	85.0*	85.0*
Agar+chaff	12.3	36.6	84.0	84.0*
Rice dust	7.6	57.3	83.3	84.0*

** Initiated to produce sclerotia * Average of 3 replicates.

Table 2 - Effect of different media on *Rhizoctonia solani* sclerotia production.

Medium.	Growth characters.		
	Mycelial growth.	*Sclerotial initiation	Number of selerctia produced
Chaff	fast	10	94.3
Straw	Medium	24	93
Water agar	very fast	4	20.3
Husk	medium	6	17.6
Saw dust	slow	32	7
Grain	Very fast	3	> 3000
Chaff+grain	fast	3	490
P D A	very fast	3	65.6
Agar+chaff	fast	4	143.6
Rice dust	fast	4	39.6

* days after inoculation.