**Synopsis of Research Programme for MS Course**

**By**

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**Title of the research work**

**In English:** Organic management of red rotof sugarcane

**In Bengali :** আখের লাল পঁচা রোগের জৈব ব্যবস্থাপনা

**Introduction**

Sugarcane (*Saccharum officinarum* L.) belongs to family poaceae is an important long durational cash crop cultivated in most of the area of Bangladesh. During the period of 2017-2018, total sugarcane cultivation area was 2.23 lakh acres with total production of 36.39 lakh metric ton (BBS, 2018). During 2017-2018 sugarcane gross value added of agriculture sector and sub-sector at current prices about 16687 million tk and at constant prices 8653 million tk. (BBS, 2018). However, more than 100 diverse diseases have been reported in sugarcane which are caused by fungi, bacteria, viruses, nematodes and phytoplasma. Among those diseases, red rot (*Colletotrichum falcatum*) of sugarcane is most important one causing huge (10-50%) financial losses by deteriorating the juice quality and the overall production as well as degeneration of varieties of sugarcane (Viswanthan, 2010 & Ghazanfar and Kamran, 2016). It is aptly called the “cancer” of sugarcane. However, amount of annual consumption of general fungicide was 6199.66 MT/KL (BBS, 2018). But uncontrolled use of pesticides has resulted in poisoning and 0.22 million death including reduction of several terrestrial and aquatic animal and plant species in developing countries (Helfrich et al., 2009). So, organic management of disease is an alternative way to control diseases keeping safe of human beings, domestics animals & typically environment (Alam *et al.*,1987). Application of *Trichoderma* spp*.* as bioagents through soil and sett protected the cane stalks against red rot infections (Singh V., 2012). *Bacillus subtilis* as well as *Pseudomonas* spp. also protect the cane from the red rot disease by colonize the root or production of chitinase enzyme(Hassan *et al*., 2010; Malathi & Viswanathan, 2013). Different plant extracts is also effective against red rot of sugarcane (Abbas *et al*., 2016). Such type of research work on organic management of red rot of sugarcane is initiated a little in the northern part of Bangladesh especially at Dinajpur region. Hence, this research work is undertaken to control red rot diseases of sugarcane using some bio agent and plant part extract of Neem, Nishinda, Ginger, Datura and Garlic.

**Objectives:**

1. To find out the efficacy of the treatment(s) against red rot of sugarcane.
2. To find out the superior treatment(s).

**Materials and Methods:**

**Experimental site**: The experiment will be conducted in a region of Dinajpur district in Bangladesh.

**Duration of the experiment**: The experiment will be carried out during 2020 to 2021.

**Management:** To manage red rot diseases of sugarcane following experiment will be carried out-

**Experiment 1:** Use of botanical extracts with (S) concentration : The following botanical extracts will be used-

T0= Control

T1= Leaf extract of Neem (S)

T2= Leaf extract of Nishinda (S)

T3= Fruit extract of Datura (S)

T4= Rhizome extract of Ginger (S)

T5= Clove extract of Garlic (S)

**Experiment 2:** Use of botanical extracts with (S/2) concentration :The following botanical extracts will be used-

T0 = Control

T1= Leaf extract of Neem (S/2)

T2= Leaf extract of Nishinda (S/2)

T3= Fruit extract of Datura (S/2)

T4= Rhizome extract of Ginger (S/2)

T5= Clove extract of Garlic (S/2)

**Experiment 3:** Use of biological agents: The following biological agents will be used-

T0= Control

T1=*Trichoderma viride*

T2*= Pseudomonas* sp*.*

T3*= Bacillus subtilis*

**Methods:**

All the treatments used in the experiment will be carried out in the following methods -

1. Sett treatment, soil drenching & spraying.

2. Sett treatment & spraying.

3. Soil drenching & spraying.

**Experiment 4:** Selection of superior treatment(s) from the conducted experiment (1-3) followed by used method(s) to control red rot (*Colletotrichum falcatum*) of sugarcane.

**Experimental Design:** The experiment will be carried out in Randomized Completely Block Design.

**Replication**: Three

**Data to be collected:** The data will be collected on the following parameters:

**Germination parameter:**

* Total number of bud
* Percent of normal germinated bud
* Percent of abnormal germinated bud

**Vegetative parameter:**

* Number of tiller
* Plant height (cm)
* Leaves/plant

**Disease parameter:**

* Disease incidence
* Disease severity

**Yield parameter:**

* Number of millable canes
* Average cane weight
* Total cane yield

**Data analysis**: Data will be analysed with the help of computer software MSTAT-C.

**Socio-economic importance:**

Red rot is a major disease of the highly economic cash crop i.e sugarcane. Though various control measures like physical, biological, botanical, chemical etc. have been practicing for controlling this disease. But management through organic practices have greater economic and environmental impacts over the other practices because the use of chemical not only costly but also mostly responsible for environmental pollution. That's why the use of organic practices can be the best effective way to control red rot disease of sugarcane.

**Expected** **Result:** Sustainable as well as superior control measure of the used treatment are to be boosted up through the experiment to control red rot (*Colletotrichum falcatum*) of sugarcane purposively.

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