SYNOPSIS ON

DISSERTATION REPORT

Management of grey mold (*Botrytis cinerea)* of chickpea (*Cicer arietinum* L.) by using chemicals

Submitted To

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CERTIFICATE

This is to certified that this synopsis entitled**" Management of grey mold (*Botrytis cinerea)* of chickpea (*Cicer arietinum* L.) by using chemicals"** submitted in partial fulfilment of requirements fir degree – Master of Science in Plant Pathology by **Ishan Raheja, Registration no. 11616897** to Department of Plant Pathology, School of Agriculture, Lovely Professional University, has been formulated and finalized by the student himself on the subject.

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DECLARATION

I hereby declare that the project work entitled **" Management of grey mold (*Botrytis cinerea)* of chickpea (*Cicer arietinum* L.) by using chemicals"** is an authentic record of my work carried at **Lovely Professional University** as requirements of Project work for the award of degree -Master of Science in Plant Pathology, under the guidance of **Dr. Adesh Kumar**, Assistant Professor, School of Agriculture, Lovely Professional University, Phagwara, Punjab, India.

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INTRODUCTION

Cicer arietinum L. (chickpea) which is generally called gram is a competent crop in all the pulses and positioned first in production as well as area. Chickpea is a major crop in more than 45 nations of Asia, Africa and America. Globally it has a total production of about 9.2 million sown over an area of about 12 million (1999). India ranks first followed by Pakistan, Ethiopia, Burma both in production and acreage. In India, as a most important pulse crop large area of land is cultivated with chickpea and it includes several parts of country. Major chickpea growing areas of India are Rajasthan, Madhya Pradesh, Uttar Pradesh, Maharashtra Haryana, and Punjab. Chickpea occupies 6.3 million hectares and produces 5.1 million tonnes with an average yield of 806 kg per acre in the country. Chickpea is a significant source of protein in nutrition of humans, also used as feedstuff for cattle and increases fertility of soil by fixation of nitrogen. It contains 4.5% fat, 21.1% proteins, 61.5% carbohydrates, and also rich in iron, calcium and niacin. Chickpea is consumed as fried or boiled and salted but generally cooked as split pulse and eaten. It is also used as vegetable. For making sweets, chickpea flour (besan) is used. As using for blood purification it is considered to have medicinal effects. Husk and bits of 'dal' are good feed for cattle. Straws of chickpea is also a very good fodder for animals.

Chickpea is basically winter season crop. For well growth it requires good moisture with optimum temperature between 24 to 30 degree centigrade with an annual rainfall of 60 to 95 cm. First and second week of October is ideal time for sowing under both rain fed and irrigated conditions. Manures and fertilizers in the crop is depend on soil fertility. In case of poor soils, it needs FYM and nitrogen 25kg/ha, phosphorus and DAP 125 to 150kg/ha before sowing. Chickpea is mainly a rain fed crop

but it is also grown in well irrigated conditions with about 4 light irrigations. It cannot bear flooding of water, so proper drainage should be in the field.

The production and productivity of chickpea is affected by many insect pests and diseases. The main insect pest of chickpea are cutworms and pod borer which cause heavy loss. The major diseases of chickpea are Grey Mold, Ascochyta Blight, Wilt, Sclerotinia Blight, Rust. Botrytis grey mold BGM (*Botrytis cinerea*) is the another main disease after Ascochyta blight in chickpea. BGM can cause heavy loss in chickpea crop resulting in complete yield loss under favorable environment for the pathogen (Pandey et al. 1982, Reddy et al. 1993;).

Botrytis cinerea are saprophytes and causes necrotrophic infection and can disseminate to places as airborne plant pathogen. Although many cultural practices and fungicides have been used for its management, the efficacy of the fungicide over the pathogen has showed poor results. Considering the nature of the disease and the works carried out by previous scholars, my work focuses on the use of various cost effective and easily accessible fungicides and its combinations for the effective management of the GMD.

OBJECTIVE

- Foliar application of fungicides
- Assessment of disease severity, disease incidence
- Assessment of poison food technique

Review of Literature

Efficacy of Propiconazole (Tilt 250 EC), Difenoconazole (Score 250EC), Fenamidone+Mancozeb (Secure 600 WG), Carbendazim (Bavistin DF), Tebuconazole (Folicure 250 EC) were tested in field conditions. Fenamidone+Mancozeb (Secure 600WG) sprayed at the rate of 1g/L with 7 days interval gave the lowest disease severity with increased yield. (SHAHIDUZZAMAN1 2015)

Seven fungicides were tested in vitro and in vivo against grey mould of chickpea. Under in vitro all the evaluated fungicides restricted the fungal growth to a significant level. Complete control was achieved with Bavistin (0.1%), iprodione (0.1%) and bavistin (+) thiram (0.3%). Bavistin or bavistin + thiram (1:2) treatment of seeds followed by 3 sprays of bavistin (0.1%) @ 15 days period gave excellent control and highest grain yield. (Suyal and Tripathi 2011)

All 11 fungicides tested checked the growth of Botrytis cinerea in vitro to a significant level, the best being Topsin-M (thiophanate-methyl), Bavistin (carbendazim) + thiram, Rovral (iprodione) and Bayleton (triadimefon). Seed-borne infection (>94%) was checked completely by 3 g each of (carbendazim + thiram), and Dithane M- 45 (mancozeb) and 1 g each of triadimefon and Baytan (triadimenol) per kg seed upon seed treatment. This seed treatment and 1 spray of mancozeb, Hexacap, thiram, thiabendazole, Baytan or triadimefon 50 d after sowing or at the appearance of symptoms gave complete control of both primary and secondary infection of *Cicer arietinum*. (Singh and Kaur 1990)

Among the six fungicides tested, one was protectant, two systemic, and three combination formulations. The combination formulations involving both protectant and systemic fungicides showed superiority over the sole application of either fungicide separately. (Rashid, et al. 2014)

The mixture Of diethofencarb and carbendazim proved the most efficacious among the nineteen fungicides against gray mold pathogen on the paprika fruit: while the mixture of tebuconazole and tolyfluanid was the most effective in controlling gray mold in in-vitro condition (Yoon, et al. 2008)

Thiram, mancozeb, captan, dichlofluanid, tolylfluanid are recognized as the five group of fungicides those affects the microtubule assembly, respiration, osmoregulation, sterol biosynthesis inhibitors and their toxicity is reversed by amino acids. These multisite effectors are been used against *B. cinerea* without developing substantial resistance in field populations for a long time. (Rosslenbroich and Stuebler 2000)

Strobilurin fungicides are broadspectrum fungicides used for the control of various diseases. Its also concluded that anilinopyrimidines are effective botryticides with capability to antagonize the pathogen by methionine and other amino acids. These fungicides can disturb the sequence of pathogenesis by preventing the secretion of hydrolytic enzymes that play a role in pathogenesis and help produce defensins in plants. (Miura, et al. 1994)

Cucumber isolates of phenotype sprayed with mixture of Carbendazim + Diethofencarb against grey mould under greenhouse conditions were found to be pathogenic in artificial inoculation with iprodione, carbendazim, or carbendazim + diethofencarb. (Elad, Yunis and Katan 1992)

Materials and Methods

Plot size- 500 sq. m

Treatment- 08 (including control)

TREATMENT	DETAILS
T1	MANCOZEB 75% WP
T2	CARBENDAZIM 12% + MANCOZEB 63% WP
T3	CARBENDAZIM 46.27% SC
T4	PROPINEB 70 WP
T5	THIOPHANATE METHYL 70% WP
T6	PROPICONAZOLE 25% EC
T7	TABUCONAZOLE
T0	CONTROL

LAYOUT

R1	R2	R3
T1	T8	T4
T2	T7	T3
I R R I G A T I O N C H A N N E L		
T3	T6	T2
T4	T5	T1
T5	T4	T8
I R R I G A T I O N C H A N N E L		
T6	T3	T7
T7	T2	T6
T8	T1	T5

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