

Chapter V
Summary
And
Conclusions

Satara is the one of the districts of Maharashtra, located within $16^{\circ}.50'$ to $18^{\circ}.10'$ N latitude and $73^{\circ}.45'$ to $75^{\circ}.0'$ E longitude. Satara district is spread over 10580 sq.km. area (Gazatter of Satara district). Satara district is located at the cushions of the Sahyadri ranges.

Main hill features of the Satara are Ajinkyatara, Yewteshwer and Kas towards west, Pateshwar toward South, Mahabaleshwar towards North West. The soil varies from tract to tract. Mostly it covers the basaltic to laterite which gives rise to red loamy soil, black cotton and clayey soil rich in humus. Climate of Satara is similar to the climate of the whole Maharashtra through of the year different and distinct seasons are recognized, these are Summer – February to May, Monsoon – June to Sept., Post-Monsoon – October to mid December and Winter – mid December to February.

Favourable climate condition and associated rainfall is most part of the Satara district is excellent for agriculture. Agriculturally Satara is advanced and most of the major crops like rice, wheat, jowar, bajara, pulses, gram, groundnut, soybean, sunflower etc. are successfully cultivated in the district.

To study groundnut and gram seeds, the field observation, control of seed borne fungi during seed treatment, identification of fungal colonies was undertaken.

Field survey observations were made by visiting the fields periodically as per the growth of plants. Observation regarding groundnut are after taking the photos from all corners of the field. There is no 100% germination of seeds, 5% of seeds were not germinated. The reason for that is loss of viability of seeds. This viability is lost due to attack of seed borne and soil borne fungi on the seeds. Seeds which were germinated are found to develop upto seedling stage. 2 to

5% seedling were found diseased or abnormal. These 2 to 5% diseased plant are used for control and management of fungal pathogen for seed.

Seed treatment is safest method of direct plant disease control. Seed treatment with two chemicals were tried namely sulphur and mercuric chloride. The seeds were treated with this chemical by changing the period of treatment.

Groundnut :

Sulphur Treatment :

Groundnut seed considered to study seed treatment of sulphur. 1% concentration for 6 hours time period for seed germination percentage was maximum in *Arachis hypogaea* L. is about 100%. 1% concentration for 12 hours time period for seed germination percentage was in *Arachis hypogaea* L. is about 80%. 1% concentration for 24 hours time period for seed germination percentage was in *Arachis hypogaea* L. is about 60%.

2% concentration for 6 hours time period for seed germination percentage was maximum in *Arachis hypogaea* L. is about 100%. 2% concentration for 12 hours time period for seed germination percentage was in *Arachis hypogaea* L. is about 70%. 2% concentration for 24 hours time period for seed germination percentage was in *Arachis hypogaea* L. is about 50%.

5% concentration for 6 hours time period for seed germination percentage was maximum in *Arachis hypogaea* L. is about 100%. 5% concentration for 12 hours time period for seed germination percentage was in *Arachis hypogaea* L. is about 80%. 5% concentration for 24 hours time period for seed germination percentage was in *Arachis hypogaea* L. is about 50%.

In all sulphur treatment plates the seed germination was favourable, so it can be concluded that the concentration of sulphur are favourable for seed. If such treated seeds are used for sowing in the field there will be maximum germination and crop will be healthy. Such crop will be free from all types of seed borne diseases. In case of groundnut crop the seed treatment with sulphur are useful to control seed borne diseases. 5% concentration for 6 hours is most favourable concentration for seed germination.

HgCl₂ treatment :

Groundnut seed considered to study seed treatment of HgCl₂. 0.1% concentration for 6 hours time period for seed germination percentage was minimum in *Arachis hypogae* L. is about 40%. 0.1% concentration for 12 hours time period for seed germination percentage was less in *Arachis hypogae* L. is about 20%. 0.1% concentration for 24 hours time period for seed germination percentage was very low in *Arachis hypogae* L. i.e. 0% .

0.2% concentration for 6, 12 and 24 hours time period for seed germination percentage was very low in *Arachis hypogae* L. i.e. 0%.

0.05% concentration for 6 hours time period for seed germination percentage was maximum in *Arachis hypogae* L. is about 100%. 0.05% concentration for 12 hours time period for seed germination percentage was average in *Arachis hypogae* L. is about 50%. 0.05% concentration for 24 hours time period for seed germination percentage was average in *Arachis hypogae* L. i.e. 50%.

0.05% HgCl₂ treatment for 6 hours is most favourable for the seed treatment. Due to this treatment seeds are made totally free from the attack of fungal pathogen and also germination percentage is 90 – 100%. In case of

groundnut crop the seed treatment with Mercuric Chloride are useful to control seed borne diseases.

Gram :

Field survey observation were made by visiting the fields periodically as per the growth of plants. Observation regarding Gram are after taking the photos from all corner of filed. There is 100% germination of seeds. Seeds which were germinated are found to develop upto seedling stage. Seedling were found healthy plant.

Sulphur Treatment :

Gram seed considered to study seed treatment of sulphur. 1% concentration for 6 hours time period for seed germination percentage was maximum in *Cicer arietinum* L. is about 100%. 1% concentration for 12 hours time period for seed germination percentage was in *Cicer arietinum* L. is about 80%. 1% concentration for 24 hours time period for seed germination percentage was in *Cicer arietinum* L. is about 60%.

2% concentration for 6 hours time period for seed germination percentage was maximum in *Cicer arietinum* L. is about 100%. 2% concentration for 12 hours time period for seed germination percentage was in *Cicer arietinum* L. is about 60%. 2% concentration for 24 hours time period for seed germination percentage was in *Cicer arietinum* L. is about 50%.

5% concentration for 6 hours time period for seed germination percentage was maximum in *Cicer arietinum* L. is about 100%. 5% concentration for 12 hours time period for seed germination percentage was in *Cicer arietinum* L. is about 70%. 5% concentration for 24 hours time period for seed germination percentage was in *Cicer arietinum* L. is about 50%.

In all sulphur treatment plates the seed germination was favourable, so it can be concluded that the concentration of sulphur are favourable for seed. If such treated seeds are used for sowing in the field there will be maximum germination and crop will be healthy. Such crop will be free from all types of seed borne diseases. In case of gram crop the seed treatment with sulphur are useful to control seed borne diseases. 5% concentration for 6 hours is most favourable concentration for seed germination.

HgCl₂ treatment :

Groundnut seed considered to study seed treatment of HgCl₂. 0.1% concentration for 6 hours time period for seed germination percentage was minimum in *Cicer arietinum* L. is about 40%. 0.1% concentration for 12 hours time period for seed germination percentage was low in *Cicer arietinum* L. is about 30%. 0.1% concentration for 24 hours time period for seed germination percentage was very low in *Cicer arietinum* L. i.e. 0%.

0.2% concentration for 6, 12 and 24 hours time period for seed germination percentage was very low in *Cicer arietinum* L. i.e. 0%.

0.05% concentration for 6 hours time period for seed germination percentage was maximum in *Cicer arietinum* L. is about 100%. 0.05% concentration for 12 hours time period for seed germination percentage was average in *Arachis hypogaeae* L. is about 50%. 0.05% concentration for 24 hours time period for seed germination percentage was average in *Cicer arietinum* L. i.e. 50%.

0.05% HgCl₂ treatment for 6 hours is most favourable for the seed treatment. Due to this treatment seeds are made totally free from the attack of fungal pathogen and also germination percentage is 90 – 100%. In case of

groundnut crop the seed treatment with Mercuric Chloride are useful to control seed borne diseases.

On the basis of above it is concluded that in case of gram HgCl_2 is a best seed treatment solution at 0.05% concentration for 6 hours time period to manage seed borne pathogen. Thus we can recommend to the research workers that 0.05% HgCl_2 treatment is most useful to avoid attack of the fungi on the seeds.

In case of groundnut and gram crop the seed treatment with sulphur and mercuric chloride are useful to control seed borne diseases. Sulphur treatment seeds are used for sowing in the field, there will be maximum germination and crop will be healthy. The most favourable concentration are 5% for 6 hours time period for sulphur and 0.05% for 6 hours time period for HgCl_2 . Instead of controlling the diseases in the field, if it is done by sulphur seed treatment it is more effective and most essential. Instead of controlling the seed borne fungi in the laboratory, if it is done by mercuric chloride seed treatment it is more effective.

In groundnut and gram crop seeds the fungal colonies developed on control plates. Groundnut seed considered to study seed borne fungi. While studying seed borne fungi of *Arachis hypogaea* L. (groundnut) about 39 species of fungi belonging to 4 genera were revealed with seeds. Genus *Aspergillus* ranked first displaying 33 species followed by *mucor* (2), *Rhizopus* (3), *Alternaria* (1). Fungal species confined only to seeds of groundnut were *Aspergillus atropurpureus*, *A. luchuensis*, *A. nanus*, *A. sclerotiorum*, *Mucor circinelloides*, *M. griseo-cyaneus*. In the present analysis control blotter plate method gave best results.

Gram seed considered to study seed borne fungi. while studying seed borne fungi of *Cicer arantinum* L. (gram) about 4 species of fungi belonging to 3 genera were revealed with seeds i.e. *Alternaria dianthicola*, *A. niger*, *A. oryzae*, *Drechslera australiensis*.

To control and kill all there fungal propegules seed treatment is most essential.

The suggestions to the farmers :

- 1) Proper precaution at the harvest and during post harvesting operations helps to reduce occurrence of storage fungi. Seeds which are cleaned and dried are ideal for storage.
- 2) Seed treatment should be primarily used to provide additional security that disease free seeds has been obtained.
- 3) Crop rotation is the cultural practice to control seed borne infection.
- 4) Consumers and peoples for not using the treated seeds for consumption.
- 5) Use the certified seeds or disease resistant variety for cultivation in the every year.