Seed is the basic unit in crop production technology. It plays an important role in the healthy crop production. The seeds carry a heavy load of microorganisms which are capable of causing severe diseases and considerable loss of the yield. These microorganisms enter into the seed coat; cotyledons and embryonic parts of the seed from field and also proliferate the infection during the ill storage condition. Microorganisms with the seeds cause several types of abnormalities like seed damage, reduction in germination, seed-discolouration, seed-biodeterioration, seed-poisoning etc. Such infected seeds have poor in quality for consumption as well as seed industry.

It is revealed from the literature that fungi associated with the seeds utilize seed contents and produce toxins in the seeds. Such seeds are known as biodeteriorated seeds. Such seeds are also carry diseases to the next generation. In order to control such diseases it is very important to observe the seed health condition which includes percent seed germiability and percent seed mycloflora. Workers in the field of pathology have recommended various types of chemical treatments for the control of seed-borne diseases. It is also observed that use of deadly poisonous chemicals has been found to create many side effects on environment, soil and health.
of the life on the earth. Nowadays a new approach to control the seed-borne fungi is being developed by using biopesticides. Such type of disease management is becoming more popular and eco-friendly. Considering the importance of the fact the present topic ‘Studies on biocontrol of seed-borne pathogens of some crops’ has been selected for the research.

The first part of research is fully concentrated on the collection of seed samples from the field, market places, and store houses from different districts of Marathwada region of the Maharashtra state. These seeds were employed to detect the external and internal seed-borne fungi associated with the seed by using standard blotter paper method and agar plate method as recommended by ISTA (1966).

A comparative account of seed mycoflora of naturally abnormal non-treated seeds with treated seeds by surface sterilizer (HgCl₂) and seed treated with neem leaf extracts were studied in detail. Seed categorically representing cereals like jowar (*Sorghum vulgare* L.) and Bajra (*Pennisetum americanum* (L.) K. Schum.) legumes like pea (*Pisum sativum* L.) and Gram (*Cicer arietinum* L.), oil seeds like Groundnut (*Arachis hypogaea* L.) and Safflower (*Carthamus tinctorius* L.), vegetable seeds like Tomato (*Lycopersicon esculentum* Mill.), Brinjal (*Solanum melongena* L.), spices like Dhania (*Coriandrum sativum* L.) and Jeera (*Cuminum cyminum* L.) showed significant variation in qualitative and quantitative seed mycoflora. The seeds treated with neem leaf extracts in case of vegetable seeds and seeds of spices found to be very promising to control the seed-borne fungi.
Among the total seed mycoflora of the crops studied for isolation dominant fungi namely *Alternaria alternata*, *Aspergillus flavus*, *Curvularia lunata*, *Fusarium roseum*, *Penicillium notatum* were frequently occurred on almost all types of seeds. Hence for further studies these five fungi were used.

A large number of Angiospermic plants were screened to know their antifungal activities. Plants with different groups, family, characters and active principles were employed for screening with the dominant seed-borne fungi. It was interesting to note that out of the 151 plants screened, plants like *Azadirachta indica* A. Juss., *Aegle marmelos* (L.) Corr., *Datura stramonium* L., *Jatropha curcas* L., *Lantana camera* L., *Ocimum sanctum* L., *Polyalthia longifolia* (Sonn.) Thw., *Tridex procumbens* L., *Catharanthus roseus* (L.) G. Don., *Vitex negundo* L., showed very promising results to check the growth of fungi. However, *Azadirachta indica* A. Juss. leaf extract appears to be most effective followed by aqueous leaf extract of *Datura stramonium* and *Ocimum sanctum* against growth of fungi. Effect of different plant part like stem, flower, seeds, roots were also studied. However the results showed that aqueous neem leaf extract at 10 gm / 100 ml concentration was considered to be an ideal to use as a biopesticide.

In order to understand the nutritional influence of the chemicals on these pathogens the studies were carried out on growth and sporulation of the fungi under the influence of various carbon sources, nitrogen sources,
phosphorus sources and sulphur sources. The results would be highly helpful in order to predict the pathogenicity; degree of the pathogens and nutritional values of the seeds. These results were found to be highly promising on this aspect.

Similarly, effect of antibiotics and fungicides which are traditionally used by the farmers are also studied. The degree of inhibition of pathogens with the use of these chemicals was compared with the degree of inhibition that we have studied by using biocontrol agents in the present research work.

The second part of research work is on toxin production. Out of the total botanicals screened for their ability against fungal growth. Ten botanicals are further studied for their inhibitory activity against the five fungi. Leaf extracts of botanicals namely Aegle marmelos (L.) Corr., Azadirachta indica A. Juss., Datura stramonium L., Jatropha curcas L., Lantana camera L., Ocimum sanctum L., Polyalthia longifolia (Sonn.) Thw., Tridex procumbens L., Catharanthus roseus (L.) G. Don. and Vitex negundo L, were studied against the test fungi. Test fungi growing in the presence of botanicals produced comparative less amount of toxin in the culture media. When these culture filtrates were used to study the degree of toxin production in case of the fungi, it was observed that in the presence of some botanicals degree of toxin production by these fungi was found to be reduced considerably. Experiments regarding the effect of toxin on percent
seed germination, effect on growth of root and shoot has been worked out in the present investigation.

The role of hydrolytic enzymes produced by pathogens has been stated in the degrading of the storage chemicals of the seeds. Therefore the studies on leaf extracts of different plants on the production of hydrolytic enzymes of the pathogens were carried out. It was observed that the plant extracts were found to be significantly useful.

While studying the biological control against commonly occurring seed-borne fungi it was essential to pin point the actual plant part and active principal content in it and how it is inhibitory to the fungi, effect of different plant parts were studied extensively. Effect of leaf extract, stem extract, flower extract, seed extract, root extract were employed against growth of fungi and the results are very much promising. Effect of plant products was also used as biological control. Along with higher plants, plants from lower group like Algae, Bacteria were also studied for their inhibitory activity. Presently Trichoderma is commonly used in Agricultural management to control the parasitic and non-parasitic fungi. Hence it was also studied in detailed to know the antagonistic activity of different species of Trichoderma with the test fungi. Botanicals can inhibit the growth of fungi. But to control totally systematic fungicides along with botanicals are strongly recommended. Uses of less degree of fungicides and increased doses of biopesticides will be the suggestive measures to the farmers to control seed-borne fungi.