Agriculture is the backbone of the Indian economy and villages are the life lines of growth of India. It is a very important sector for the sustained growth of the Indian economy. About 70 per cent of the rural households and 8 per cent of urban households are still principally dependent on agriculture for employment. Since some three-quarters of the population live in rural areas, a majority of households thus depend principally on this sector. In Agriculture mainly cereals, pulses, oilseeds, vegetables and fruity vegetables are cultivated for the consumption purpose as well as for export to increase the India economy. India has undergone a series of successful agricultural revolutions-starting with the ‘green’ revolution in wheat and rice in the 1960’s and 1970’s, the ‘white’ revolution in milk to the ‘yellow’ revolution in oilseeds in 1980’s. As a result, India has achieved self-sufficiency in agriculture.

India is one of the largest producers of oilseeds in the world and this sector occupies an important position in the agricultural economy covering an area of 38 million hectares, and accounting for the production of about 32 million tonnes of oilseeds annually. India contributes about eight per cent of the world oilseeds production and about six per cent of the global production of oils and fats and currently is the 4th largest edible oil economy in the world, after China, EU-15 and USA. India has a wide range of oilseeds crops grown due to the different agro-climatic zones. Groundnut, soybean, mustard/ rapeseed, sesame, safflower, linseed, castor seed are major traditionally cultivated oilseeds. The country’s attention has been focused on increasing output of three most promising oilseeds, rape, soybean, and sunflower. However, the cultivation of these oilseeds is not able to support the increasing domestic oils and fats demand resulting from population growth and higher propensity to spend.
Groundnut (*Arachis hypogaea* L.) is called as the ‘King of oilseeds’. It is one of the most important food and cash crops of India in terms of production. India is the second largest producer of groundnuts after China. It accounted for 35.99 per cent of the oilseeds production of the country during 2007-08. Gujarat is the largest producer contributing 25 per cent of the total production followed by Tamil Nadu (22.48 per cent), Andhra Pradesh (18.81 per cent), Karnataka (12.64 per cent) and Maharashtra (10.09 per cent) during 2006-07. Groundnut contains on an average 40.1 per cent of fat and 25.3 per cent of protein and is a rich source of calcium, iron and vitamin B complex like thiamine, riboflavin, niacin and vitamin A. It is used not only as a major cooking medium for various food items but also for manufacture of soaps, cosmetics, shaving creams and lubricants. In fact, it plays a pivotal role in the oilseed economy of India. The major groundnut-producing countries of the world are India, China, Nigeria, Senegal, Sudan, Burma and the USA. Out of the total area of 18.9 million hectares and the total production of 17.8 million tonnes in the world, these countries account for 69% of the area and 70% of the production. India occupies the position, both in regard to the area and the production in the world. About 7.5 million hectares is put under it annually and the production is about 6 million tonnes. 70% of the area and 75% of the production are concentrated in the four states of Gujarat, Andhra Pradesh, Tamil Nadu and Karnataka. The oil content of the seed varies from 44 to 50 per cent, depending on the varieties and agronomic conditions. Groundnut oil is edible oil. It finds extensive use as a cooking medium both as refined oil and Vanaspati Ghee. It is also used in soap making and manufacturing cosmetics and lubricants, olein, stearin and their salts. Kernels are also eaten raw, roasted or sweetened. They are rich in protein and vitamins A, B and some members of B₂ group. Their calorific value is 349 per 100 grammes. The residual oilcake contains 7 to 8 per cent of N, 1.5 per cent of P₂O₅ and 1.2 per cent of K₂O and is used as a fertilizer. It is an important protein supplement in cattle and poultry ratios. It is also consumed as
confectionary product. The cake can be used for manufacturing artificial fibre. The haulms (plant stalks) are fed (green, dried or silaged) to livestock. Groundnut shell is used as fuel for manufacturing coarse boards, cork substitutes etc. Groundnut is also of value as rotation crop. Being a legume with root nodules, it can synthesise atmospheric nitrogen and therefore improve soil fertility.

Soybean \([Glycin\ max\ L.]\) Merrill] is cultivated as commercial crops and plays an important role in Indian economy. It is third important oilseed crop next to groundnut and mustard. Soybean is grown in almost all the parts and is third major oilseed crop of India (Bhatnagar and Karmakumar, 1995). In Maharashtra soybean crop is cultivated in both in Kharif and Rabbi seasons for its commercial importance. Popularity of this crop is due to abundance (43%) high quality protein and a rich source of oil with high unsaturated fatty acids and with no cholesterol (Sharma and Mehrotra, 1988). Soybean is classified as “poor storer” as it looses viability drastically under warm and humid conditions.

Sunflower \([Helianthus\ annus\ L.\) is mainly grown for its oil. Sunflower was introduced in India as an oilseed crop for the first time in 1969. In 2008-09, world sunflower seed production was 33.3 million tons, around 8.5% of the total oilseeds production of world. European Union, Russia, Ukraine, Argentina, United States, China, India and Turkey are the major producers of sunflower seed in the world market. Countrywise, usually production of Russia is the highest followed by Ukraine. EU-27 is considered as the largest producer of sunflower seed in world when the production of all its member states is put together. Sunflower oil is healthy and natural edible oil known for its light and odorless characters, rich in Vitamin E, sunflower oil is derived from sunflower seed carrying nearly 45-50% oil content. The protein content is around 25% and sunflower meal is used as a protein source in animal feed preparation. The oil is used for culinary purposes, in preparation of vanaspati ghee and in the manufacture of soaps and cosmetics. Sunflower oil is considered as healthy oil. It is
especially recommended for heart patients. Its cake is rich in protein and is used as a cattle and poultry feed. Sunflower oil is the non-volatile oil expressed from sunflower seeds. Sunflower oil is commonly used in food as a frying medium.

The important safflower (*Carthamus tinctorius* L.) growing countries, besides India are the USA, Mexico, Ethiopia, Spain, USSR and Australia. In India, it occupies 590,000 hectares with a production of nearly 130,000 tonnes. Over 98% of the area is concentrated in the states of Maharashtra (04.4%), Karnataka (26.0%) and Andhra Pradesh (8.0%). The crop is now cultivated primarily for its seeds which yield oil, though at one time it used to be grown for the extraction of a dye also. The seeds are edible and are eaten after roasting. Their oil content varies from 24 to 36 per cent, depending on the variety, soil, climate and other conditions. The cold-pressed oil is golden yellow and is used for culinary purposes, or for making soap. The oil obtained by dry hot distillation is black and sticky and is used only for greasing well ropes and leather goods exposed to water. Safflower oil has also good dying properties and therefore it is used in the manufacture of paints, varnishes and linoleum. It can be mixed with white paint without any after-yellowing effects. The cake, particularly from decorticated seed is used as a concentrated cattle feed and that from undecorticated seed is sometimes used as a manure.

India, China, Sudan, Mexico, Turkey, Burma and Pakistan are the important sesame (*Sesame indicum* L.) producing countries. India ranks first, both in the area and production of sesame in the world. The annual area put under it in India is about 2-5 million hectares (45 per cent of the world hectarage) and the total production is nearly 52 thousand tonnes. Sesame is grown on 21 lakh hectares in only eight states, viz. Uttar Pradesh (673,000), Rajasthan (562,000), Madhya Pradesh (345,000), Andhra Pradesh (237,000) Maharashtra (139,000), Gujarat (118,000), Tamil Nadu (117,000) and Orissa (103,000. Among other states only Karnataka has a sizable area (68,000) under sesame. In the remaining states it is grown only
on a small area and hence is a very minor crop there. The sesame seed is a rich source of edible oil. Its oil content generally varies from 46 to 52 per cent. Its grains may be eaten fried, mixed with sugar or in the form of sweet meats. Sesame oil is used as a cooking-oil in southern India. It is also used for anointing the body, for manufacturing perfumed oils and for medicinal purposes. Sesame-cake is a rich source of protein, carbohydrates and mineral nutrients, such as calcium and phosphorus. The cake is edible and is eaten avidly by working classes. It is also a valuable and nutritious feed for milch cattle.

After harvesting seeds are stored in different storage conditions and if these storage conditions are not proper various microbes like viruses, bacteria, fungi and nematode are interacted with these seeds. Among these microbes, fungi play a dominant role in decreasing quality and longevity of the seeds. Fungi cause various abnormalities to the seeds like discolored seeds, damaged seeds, shrunken seeds, undersized, rotted seeds and reduced in germinability. Fungal organisms plays significant role in infection, altering quality and longevity of seeds during the storage (Christensen and Kaufman, 1969). Such seeds are not fit for human consumption and rejected at industrial level. This ultimately affect on the yield and economy of the country. In Maharashtra state, oil seeds are cultivated in both Kharif and Rabbi seasons. Out of which groundnut (*Arachis hypogaea* L.), sunflower (*Helianthus annus* L.), safflower (*Carthamus tinctorius* L.), sesame (*Sesame indicum* L.) and soybean (*Glycin max* L.) are major oil seed crops.

The literature clearly reveals that the seeds are deteriorated in storage condition with several microbes; however, species of *Alternaria, Aspergillus, Fusarium* and *Penicillium* play important role in biodeterioration of seeds. Considering the importance of this fact, research work was carried out on “Impact of Storage Fungi on Oilseed Deterioration”

Present topic has been divided in to three parts. The first part of the work was extensively be devoted for the collection of oilseed samples from
different store houses, market places, godowns and fields from different
districts of Marathwada region and detection of seed mycoflora associated
with seed samples by using the method recommended by ISTA (1966) and
Molecular characterization or DNA fingerprinting of *Fusarium* isolates by
using RAPD. Second part of the work was mainly on lipase enzyme activity
of storage fungi with respect to different physical factors and nutritional
sources. Further deteriorative changes in groundnut, soybean, sesame,
safflower and sunflower and in oils due to storage fungi were also studied.
In third part experiments were carried out on impact of culture filtrate of
storage fungi on oilseed physiology and pigment leaching. In addition to
that eco-friendly management of storage fungi was carried out by using
*Trichoderma harzianum* and *Trichoderma viride* and botanicals like leaf
extract, essential oils, plant gums and latex.