Use of pesticides in the Agriculture sector poses a serious environmental and public health problem. There exists a direct relationship between the extent of pesticide use and signs and symptoms of illness due to exposure among farmers. First warning signals about pesticides danger was given by Rachel Carson, an American courageous women scientist wrote a book entitled “Silent Spring” expressing her observations and highlighting the sudden death of birds caused by indiscriminate spraying of pesticides (DDT). Her book became a landmark. It changed the existing view on the pesticides and has stimulated public concern on pesticides and has stimulated public concern on pesticides and their impact on human health and the environment. Silent Spring facilitated the ban of the DDT in the United States in 1972. Pesticides during manufacturing, transportation, storages and actual use enter in the abiotic and biotic components of the environment through air, water and soil and disturb the cohesion, causing great disaster. The pesticides may accumulate in the environment and contaminate all the systems being transported from one system to another. Most pesticides used in agriculture today are synthetic organic chemicals
that act by interfering with a vital metabolic process in the organisms to which they targeted.

Both soil and aquatic ecosystems involve complex interactions between the flora and fauna that live in them. These are illustrated best by models of food webs or trophic-level food chains. Clearly, if a pesticide has a major impact upon any important organism in such a web or chain these effects can impact upon a large number of other organisms in the system that prey or depend upon it, particularly if the organism affected is present in large numbers or biomass. Population of plant parasitic nematodes, kept under control by fungi, can increase very significantly when these fungi are killed by a fungicide such as captan (Kerry, 1988). Bird populations can be significantly decreased when insecticides affect their food supply (Stromborg, 1982). Grain treated with insecticides such as dieldrin, chlorfenvinphos, carbofuran, phorate, fonofos, and fensulfothin has reported to be toxic to birds in various incidents (Hardy, 1990). The role of the natural enemies of pests in keeping them under control can be considerable and the importance of these parasites, predators, and antagonists is often underestimated (Pimentel, 1988).

Most agricultural practices tend to decrease the biodiversity of plants and animals. Pesticides have major impacts in decreasing the biodiversity of agricultural ecosystems. In soil, they have major effects on
decreasing the diversity of soil-inhabiting organisms since they selectively kill particular groups of organisms (Edwards and Thompson, 1973).

Most of the direct and indirect effects of pesticides discussion so far are related to the effects of pesticides on populations of individual organisms and to how these effects affect populations of other organisms. However, sometimes the impact of a pesticide can be so drastic as to influence the functioning of the whole ecosystem in a major way.

Organic matter is fragmented by a wide range of soil-inhabiting invertebrates and broken down progressively by their action and that of micro-organisms that grow on the fragmented material.

Many pesticides, which are toxic to organisms in this process – for instance, earthworms – can slow the breakdown process considerably for instance, a slowdown in organic matter breakdown has been reported for simazine (Edwards, 1989). Such effects are much more common than is reported in the literature because relatively few pesticides have been tested for their effects on organic matter breakdown. When organisms matter breakdown is slowed down significantly, this turn can have major effects on the primary productivity of the ecosystem.

Soil respiration is an index of overall microbial and invertebrate activity in soil, and soils that respire little – anaerobic accumulate mats of undecomposed organic matter and have poor fertility.
There have been relatively few studies of the effects of pesticides on soil respiration other than in assessments of the effects of pesticides on population of microorganisms (Edwards, 1989). Since mineral nitrogen is a major plant nutrient is important to know whether pesticides influence dynamic soil processes that affect the availability of nitrogen. There are many reports of depression of this process by pesticides particularly herbicides (Edwards, 1989) but such adverse affects are seldom long-term or serious. Enormous quantities of pesticides are currently used in developing countries and some tropical countries. Many pesticides do not reach their targets but instead end up on crops, trees, animals, soils, or water (Jayes and Lawes, 1991).

The greater quantity of pesticides applied to crops end up in the soil, either through aerial drift, runoff from plants, or eventual death of the plants. Depending on the nature of pesticide it may be broken down rapidly, usually by soil microorganisms, or become bound progressively onto soil fractions, such as organic matter or clay minerals, and persists weeks, months or even many years (Edwards, 1996).

Pesticides are also lost from soils by wind and water soil erosion in quite large quantities. Some of the more persistent pesticides such as DDT may end up bound in humic materials and persist for many years. For instance, Buck et al., (1983) reported residues of DDT in Arizona soils 12 years after this pesticides was withdrawn.
Pesticides can reach water as a result of direct treatment to control pests, such as mosquito larvicides, or molluscs used to control disease-carrying snails. More commonly, pesticides contaminate aquatic systems by fallout from aerial sprays, through drainage from soil, and water erosion, or through disposal of pesticide contains of effluent for pesticide factories. Runoff from agricultural land can carry between 0.5% and 15% of a pesticide treatment into an aquatic (Wauchope, 1978).

There is good evidence that large quantities of even extremely nonvolatile pesticides such as DDT eventually volatize into the atmosphere, particularly in the humid tropics (Nash, 1983). It is also possible that some residues of even the more persistent pesticides may be susceptible to photodegradation in the upper atmosphere (Edwards, 1973a, b). Many pesticides are systemic and are translocated into crops from soils. Even nonsystematic pesticides can be taken into crops. For instance, Carey et al., (1979) reported that 40% of all crops contained detectable levels of organochlorine insecticides and 10% organophosphate insecticides.

More recently, it has been estimated that about 35% of he food consumed in the United States has detectable pesticides residues (FDA., 1990).

One of the most striking effects on wildlife has been that on birds, particularly those in the higher trophic levels of food chains such as bald eagles, hawks, and owls. These birds are rare, often endangered and
susceptible to poisonous residues in their food, such as occurred through the bioconcentration of organochlorine insecticides through food chains. (Hardy, 1990). Probably the second-most-important impact on wildlife that has occurred has been the fish and marine crustacean kills that occurred due to contamination of aquatic systems with pesticides.

Serious direct effects of pesticides on soil structure and fertility are probably rare but there are also indirect effects of pesticides which are much more difficult to assess or quantify. Probably such effects are important but they are not usually long term. However, the indirect effects of pesticides in accelerating soil erosion have been much more obvious and adverse to the environment (McEwen and Stevenson, 1979).

The environmental effects of pesticides on wildlife, soil, and water all impact strongly on the human life. However, there is also increasing anxiety as to the importance of small residues of pesticides, often suspected of being carcinogens, in drinking water and food.

There are many reports of small pesticides residues in various foods, both imported and home produced (Sachs et al., 1987).

Finally, over he last 50 years there have been many human illness and deaths due to pesticides, with up to 20,000 deaths per anum, some of these incidents have been due to attempted or successful suicides, but the majority have involved some from if accidental exposure to pesticides. Such accidents are common among farmers and spray operators who are careless in
handling pesticides or wear insufficient protective clothing and equipment. However, there have been a number of major incidents which have led to the death or sickness of many thousand of human beings. Cases include emissions from chemicals plant, such as the Bhopal disaster, where 2500-5000 deaths resulted from methyl isocyanate; the TCDD incident in Italy, where 32,000 people were affected; and the death of 459 people and illness of 6070 from eating grain treated with pesticides (Hayes and Laws, 1991).

Clearly, the overall environmental impact of pesticides has many unacceptable aspects, although there has been progress in minimizing that impact in recent years. We must progressively explore alternatives to pesticides that are more ecologically acceptable and keep use of pesticides at levels which create no environmental or human problems.

From the experiments it is confirmed that pesticide affect the flora and fauna both qualitatively and quantitatively. In the growth and multiplication of fungi, Fenvalerate has the highest inhibitory effect on the mycobial population, while Malathion has the least effect. This is because, higher number of fungal population was observed in Malathion treatment. Fenvalerate, on the contrary showed the lowest fungal population. 

Aspergillus, Penicillium & Mucor are found to be the dominant genera in both treated and untreated tea soil.

In the experiment to observe the soil micro fauna, a combination of some common and few rare and unidentified species were observed. In the
pre-treatment observation, large number and variety of soil micro-fauna were found but during post-treatment period, micro fauna population were seen to have decreased considerably. The reduction is only due to pesticide applications. After three months of application, the soil micro-fauna were found to have regained its normal status. Of all the micro-fauna, some are known to be beneficial as decomposer in the soil and some are predators and parasites of many harmful organisms. Thus, this experiment with the pesticides gives alarming information about their hazardous effect on the soil biota of tea agro-ecosystem/environment in general and in relation to the reduction/increase of beneficial predator/decomposer faunal population in particular. Further experimentations are in progress to generate data on the predator-prey relationship in the tea agro-ecosystem which can be exploited in the IPM strategy in the said agro-ecosystem.

The results have showed a wide range of affect of pesticides on the soil microorganisms. Most agricultural practices tend to decrease the biodiversity of plants and animals. Pesticides seem to have major affect in decreasing the microbial (e.g. fungi) biodiversity in agricultural ecosystem. In soil they have major effect on decreasing the biodiversity of soil inhabiting organisms since they selectively eliminated the particular groups of organisms (Edwards and Thompson, 1973). By far the greater qualities and quantities of pesticides applied to crops end up in the soil, either through aerial drift, run off from plants etc. The number of micro-organisms
in all the physical compartment of the environment is extremely large and they have immense diversity in form, structure, physiology, food sources and life cycles. This diversity makes it almost impossible to assess or predict the affect of pesticides upon them. Since micro about by fungi mainly belonging to Basidiomycetes, genus Polyporus, Ustulina, Fomes etc. Among them sporulating fungi such as Mucor, Penicillium and Aspergilus are profusely found in very large numbers in the soils which are also affected by the pesticides.

Organisms can utilize most pesticides as food sources upon which they grow, indeed micro-organisms are the main agents of degradation of pesticides. However pesticides are very persistent and in soil ultimately it affects on the microbial populations. Soil organic matter comprises residues of plants and animals at all stages of decompositions mediated by the soil micro fauna and flora. Tolerance or resistance in microorganisms against pesticides is a complex process which is regulated both at physiological/genetic level of microorganism. And hence, the microorganisms that developed resistance to pesticides are frequently capable of biodegrading them ([Kumar et al., 1996] and [Ortiz-Hernández and Sánchez-Salinas, 2010]). The temporary resistance (tolerance) against pesticides in general, is attributed to physiological changes that induce the microbial metabolism for the formation of a new metabolic pathway to bypass a biochemical reaction inhibited by a specific pesticide (Bellinaso et
Permanent resistance, on the other hand, depends upon genetic modifications, inherited by the subsequent generation of microbes ([Johnsen et al., 2001] and [Herman et al., 2005]). Gram negative bacteria have also shown tolerance to other pesticides. For instance, the maximum tolerant concentrations of different organophosphorus pesticides for both *Pseudomonas* and *Flavobacterium* species isolated from polluted sites were 250, 4000 and 8000 μg ml$^{-1}$ of guthion, methyl parathion and dimethoate, respectively (Nazarian and Mousawi, 2005). Among the herbicides, metsulfuron methyl was more toxic compared to other herbicides and order of toxicity was: metsulfuron methyl > chlorsulfuron > thifensulfuron methyl. The variation in tolerance to pesticide by rhizobacteria could probably be due to the fact that rhizobacteria adopt different strategies to overcome the toxic effects of pesticides and such mechanisms included biodegradation (Yang and Lee, 2008) and enzymatic hydrolysis ([Dumas et al., 1989] and [Herman et al., 2005]) of pesticide.

Pesticides residue analysis of the sample collected from different sites of the Barak Valley Pesticides have various characteristics that determine how they act once in soil. Mobility refers to how a pesticide will move around in the soil. The half life of a pesticide refers to the length of time it takes for half of the pesticide to degrade. Persistence refers to the length of time until all measurable residues of a pesticide are gone. Humans can be exposed to pesticides by direct or indirect means. Direct or primary exposure normally
occurs during the application of these compounds and indirect or secondary exposure can take place through the environment or the ingestion of food (Stenersen, 2004). In this study, we focused on the pesticides chemicals used for the efficient cultivation of farm products. Many pesticides whose production and/or use are prohibited in Japan are still in use in other countries and those farm products by using pesticides and/or dusted with such chemicals are consumed and also exported. Therefore, human cannot avoid exposure to these pesticides that may occur through residues on cereals, vegetables and fruits harvested in other countries (Boobies et al., 2008).

Therefore, the toxicological and ecotoxicological effects as well as the concentration of pesticides in the environmental compartments and in food are required for the risk assessment of pesticides. The presence of pesticides in these matrices in normally referred to pesticides residues, which are defined as any original or derived residue, including relevant metabolites, from a chemical.

The poisoning of the species depends on the concentration of the pesticide in different environment compartments (e.g., water, air, and soil), and consequently a predicted environmental concentration (PEC) has to be derived and compared with the corresponding predicted no effect concentration (PNEC). Plant uptake is another pathway that may determine the fate of pesticide residues and its extent is determined by its
bioavailability. This is dependent upon many soil and plant factors, as well as the type of pesticide involved (Alloway, 1995; Barber, 1995).

Once pesticides enter the environment they have the potential to cause pollution problems. Although pesticides are targeted at relatively few specific pest organisms, their application commonly impacts upon the wider agroecosystem, affecting non-target organisms. Humans are also a category of non-target organism with occupational or accidental poisoning (e.g. pesticide drift) and food residues being possible causes of exposure.

While residues in food are an important issue, it is the direct effect of pesticide use in agroecosystems which causes environmental disruption. There are many important groups of beneficial and non-target organisms at risk from pesticide use and a single insecticide application can reduce total numbers in a cereal crop by up to 80% Beneficial organisms affected. The effect of the various pesticides or individual effect of these pesticides is warranted for, as the biochemical transformations are of paramount importance in maintaining the soil fertility. Due to repeated application of pesticides, many insect pests become resistant to pesticides. So, it is very difficult to follow organic farming system in cabbage, instead farmers are using higher doses of chemicals to manage these resistant pests which is resulting in high pesticide residue accumulation in plant tissue as well as in soil, posing threat to the human health as well as soil ecosystem. Now a days, people are very
cautious about hazards of pesticide residues. Integrated pest management is an approach, which is suitable to reduce pesticide residue accumulation in crops and also to reduce development of resistance for pesticides by insect pests. It is the pest management system in the context of the associated environment and population dynamics of the pest species utilizes all suitable techniques and methods in compatible manner as possible and maintains the pest population below the levels causing economic injury. It is not simply superimposition of a few control techniques but the integration of all suitable management techniques, with the natural regulating and limiting elements of the environment. Though the chemical and biological methods are most effective in pest control, it is proper to integrate the methods like cultural, physical and genetic into one single system. According to Apple (1979), integrated pest management is the optimization of pest control in an economically and ecologically sound manner. Shiyin et al. (2004) reported that catalase activities are inhibited when fenvalerate are added to soil in 15 days, and then the activities began to be stimulated.

Scanning electron microscopy revealed that various forms of discocyte-echinocyte transformation, stomatocyte-spherocytic changes, membrane internalization, and reticulocytogenic effects were caused by pesticides toxicity in the erythrocytes of different groups of experimental albino mice. The information obtained on membrane changes in the RBC may be useful in understanding the haematological problems which result
from pesticide toxicity. In the present work, the high percentage of cells showing Membrane internalization, Deformed discocytes, ectinocytes, spherocytes, stomatocytes in RBC of albinomice of different treatment with pesticides induced toxicity suggests that the pesticide caused haematological problems which might have havoc with human and other life form. The appearance of a high percentage of echinoagtes and Deformed discocytes, membrane internalization, spherocytes, stomatocytes and few Retionlocytes, ring shaped cell, Tear drops cell, spindle shaped cell in individuals exposed to pesticides toxicity. So, it is clear that pesticide may acts as an echincytogenic, stomatogenic, sphenocytogenic, retinlongtogenic agent for different treatment of pesticides and pesticides sprayed vegetable treatments.

It is of interest to mention that several organic and inorganic compounds have been reported to cause membrane abnormality and shape change in erythrocytes, the degree of which varied with their concentration and chemical nature (Barnhart et. al. 1978). It is well known that the abnormalities in cell shape of erythrocytes is of considerable pathological importance, and that a delicate equilibrium of extrinsic and intrinsic forces determined the shape of an erythrocyte (Bessis and Weed, 1972). Thus the correct interpretation of the fine details of RBC can yield valuable information on the physiopathological state of the cell.
Changes in blood characteristics resulting from the accumulation of pesticides occur fairly early. It has been established that pesticides inhibits the enzymes which are involved in incorporation of iron into the protoporphyrin molecule to form haeme.

In blood, the target of toxicity for a variety of sparingly soluble toxicants is the erythrocyte membrane, which is frequently used for the study of the interaction of xenobiotics with biomembranes. All disordered red blood corpuscles (RBC) manifest some time to loss of membrane plasticity, which greatly impairs RBC movement through the microvasculature (Young et. al. 1951; Barnhart and Lusher, 1976). The slightest damage to this membrane can cause haemolysis, resulting in constituents leaking out of the corpuscles. the appearance of different types of membrane abnormalities in albino mice induced toxicity with pesticides is most interesting. Thus, the mechanism by which the element affects erythrocytes during their development and whether the changes observed in the albino mice are permanent or reversible.

Transmission Electron microscopic study showed variation in size and shape reflecting abnormal cell division and maturation. Abnormalities in nuclear morphology are frequently observed in malignant tissues. Mitochondrial abnormalities effects in electron transport activities resulted typical neurological problems. Abnormal shape of nucleus is associated with cancer. The mitochondrial abnormalities are mainly oxygen deprivation,
inhibitors of respirations and phosphorylation in a animal cell. The membrane distortion of nucleus, mitochondria and discontinuation of endoplasmic reticulum structure and numerous free ribosomes in the cytoplasms was observed in the liver and kidney cells of albino mice. This is only due to toxic effect of pesticides. Carcinogens induce nuclear enlargement. Malignant tissues frequently exhibit abnormal nuclear morphology including size, shape etc. Mitochondrial distortion by pesticides effect cell respiration, ATP transport, lipid synthesis. By the effect of pesticides in endoplasmic reticulum effects osmosis diffusion and active transport.

The effects of pesticides on blood parameters shows presence of toxic substance. The changes in blood resulting from the accumulation of pesticides. The respiratory function of erythrocytes is carried out by the haemoglobin which can combine with oxygen and carbon dioxide. Erythrocytes absorb amino acid and transporting them to the cells of the body from the digestive organs. It maintains pH and ionic balance of the blood. So, all the functions were affected by the exposure of pesticides. The effects of pesticides on blood parameters shows presence of toxic substance. Haematological studies on human beings have assumed greater significance due to the increasing emphasis on environmental pollution by pesticides or other chemicals.
Such studies have generally been used as an effective and sensitive index to monitor physiological and pathological changes in animal or human beings. In recent years, haematological variables were used more when clinical diagnosis of human physiology applied to determine the effects of external stressors and toxic substances as a result of the close association between the circulatory system and external environment. Blood parameters are used as an indicator of pollution and describe general health condition of the species in different stress condition like chemicals, pesticides exposure. Blood cell response are important indicator changes in the internal and external environment of animals. The change in blood parameters occurs because of the injury or the infections in organs.