Essay on securing sufficient and healthy food

Environment, Animals

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Question 1: Food Security and Climatic Change

The right to food is an essential human right. To live healthily and have a productive life, human beings must have access to a reliable supply of food. This is food security. Climatic changes are the long term changes in the average weather conditions. Agriculture is crucial for food security because, it provides the food eaten by people, and a source of livelihood for about 36% of the total workforce in the world. The dependency on agriculture is slightly higher in Africa and Asia. If climatic change adversely affects agricultural production in these regions, the risk to food insecurity will be increased. Food security depends on agricultural production, which is markedly influenced by climatic change. Climatic change will affect food supply at the local level and global level. Globally, temperate regions could experience higher yields, and lower yields in the tropical regions. In low income countries, which depend on their own food production, a drop in the food supply would increase reliance on food aid. The impact of climatic

change on agricultural production will affect access to food. Since food producers, especially in rural areas, are unable to deal with climatic change, their safety and welfare remain at risk. Other important factors of food security include food processing, distribution, acquisition, preparation, and consumption. Technological improvements and long distance marketing chains that facilitate the movement of packaged foods around the world at low cost have made the performance of food systems somehow independent on climate. Nevertheless, with increasing climate change, the risks of damage to food transport and distribution systems increase. Consequently, food supply chains could be disrupted. An increase in global mean temperatures as a result of accumulation of greenhouse gases could affect the following food systems. Reduced food availability in affected areas, changes in income, food prices and affordability, increased risk of dehydration, ill health from consuming unhealthy food, and reduced ability of the body to process food because of heat or disease.

Question 2: Wheat Spindle Streak Mosaic

It is also known as wheat yellow mosaic. It is a common wheat disease that is caused by wheat yellow mosaic virus. It causes damage to wheat when conditions facilitate infection and disease development. Its symptoms are distributed uniformly across wheat fields; however, they fade with warm mid spring temperatures. If symptoms persist, damage to yield could occur. The symptoms vary with from one wheat variety to another. When the crop is green, yellow dashes appear on the foliage. These run parallel to the leaf vein. With age, the dashes form spindle shaped lesions that give the disease its name. With the persistence of the symptoms, the affected wheat plants

become stunted and thin. The virus affects some wheat varieties more severely than others. McNair 1003 variety develops lesions with dead areas that look like lesions caused by bacterial streak. Saluda variety develops yellow reaction on its leaves that persists throughout the season without seriously affecting the yield. The virus is transmitted by the soil borne fungus, Polymyxa graminis. These organisms occur in large numbers, in Kentucky agricultural soils. It has the ability to survive many years of winter. The virus attacks the plants when zoospores are released into the soil and penetrate root tissues. The infection occurs mainly in fall although it can also occur in winter and spring. The wheat remains asymptomatic until the next spring. Wet soils favor the disease; however, excess moisture is not necessary for severe disease occurrence. Symptoms are severe in spring. In warm springs, the infections show no symptoms and could result in low yields though minimal. Persistent symptoms could reduce the yields by up to 25%. This, in turn, would reduce the availability of wheat flour in the market and increase its cost. Infections in fall make the disease unmanageable by use of fungicides during spring. Recommended management practices include developing wheat varieties that are resistant, and postponing planting until mid-October or later. The delay ensures that seedlings will emerge in cool soils, which are unfavorable to the activity of P. graminis.

Question 4: Environmental Effects of Pesticides

Pesticides include all chemicals used to suppress animal and plant pests with the aim of protecting agricultural products. Majority of them not only target pests but also other organisms. Continuous use of pesticides leads to the loss of biodiversity. Most of them are non- biodegradable and stay long in the

soil, contaminate groundwater and the environment. Other chemicals can enter the plant, accumulate in food chains and eventually affect the health of humans. Pesticides enter the soil during plant treatment. Their degradation depends on the chemical and biological properties of the soil. These factors affect sorption, degradation, plant uptake and run-off of pesticides. They can get into the water by runoff or underground water through seepage into the soil. Pesticides are toxic to freshwater organisms. Soil microorganisms are essential for the maintenance of the structure of soil. Fungicides were identified to be toxic to soil fungi. Non chemical pesticides have been introduced in an effort to replace the harmful chemical ones. Birds eat insects, while bats eat ladybirds. Other insects are also used to reduce pests. Parasitoids like wasps lay eggs inside pests such as tomato hormworms. When the egga hatch, the hormworms are killed. Microscopic pathogens like specific bacteria and biochemical pesticides like insect hormones have also been used to control pests. The major hindrance towards phasing out of the use of pesticides has been the inability to come up with a more effective method of pest control. Pesticides still remain as the most effective method of pest control. However, guidelines have been set to ensure their usage result into minimal environmental hazards.

Question 5: Aflatoxins in Corn

Aflatoxins are chemicals produced by the fungi, Aspergillus flavus and Aspergillus parasiticus. It can be identified in corn, whether in the fields or in storage. Moldy corns have a greater risk to contamination than non-moldy corn. They are fatal to livestock and carcinogenic to humans. The fungus produces more toxins in warm nights in a drought period. Aflatoxins are

localized in small areas of grain rather than uniformly throughout grain. This makes sampling every part of a unit of corn the best way to test for it. Two methods of screening tests are used to test for aflatoxin. These are; blacklight and commercial test kits. The accepted level of aflatoxin in corn is 20 ppb. Anything above this level is not accepted into the market. Acute aflatoxicosis has been reported in humans. Its symptoms include vomiting, pulmonary edema, coma and death. Reports indicate that children exposed aflatoxin through breast milk are at a risk of developing cirrhosis. Aflatoxin 1 is the most abundant aflatoxin and is carcinogenic. The key to prevention of aflatoxin is early detection. Pest control may also help to reduce infection because they damage crops exposing them to infection. The use of clean bins and grain harvesting and handling equipment also cleaned to minimize the spread of infection. Clean harvested corn should be kept at a moisture level of 16-17% in winter. Moldy corn should be dried to 15% moisture. Antifungal agents should be applied to the grain to prevent the growth of mold. Occasional checking of grain should be done to detect changes in temperature, mold, and moisture. Before selling of grain, the level of antifungal agents should be allowable .

Question 8: Biosecurity Measures

Biosecurity involves the prevention of a disease causing agent from leaving or entering a place where animals are kept. Through these measures, it ensures that these agents do not spread to humans, for instance, through consumption of an infected animal. The measures, commonly used in biosecurity include to monitor, survey, isolate, transport, limit, eliminate, eradicate, and prevent the spread of infection. Through monitoring, it is

possible to detect changes in disease prevalence in a population as soon as possible. This way, necessary actions can be taken to prevent the escalation of the disease. A veterinary doctor can be consulted to offer advice. Harmful diseases are grouped into two, list A, and B. list A consists of 15 diseases with the potential to spread very fast. List B includes diseases that can be easily transmitted, such as, Anthrax, Heartwater, Q fever, and Rabies among others. Once the disease has been identified, the sick animal or herd is isolated to prevent an increase in the severity of the problem. Depending on the diagnosis, the animals can either be treated or killed. Killing is done quickly and in a humane way. Prevention is a fundamental aspect in biosecurity. To achieve this, animal buildings and movements are designed to meet biosecurity measures. The building should be in such a way that the livestock are raised in batches. This makes it easier to detect any symptom, and also prevents the spread of the disease. Age segregation ensures that older animals do not infect young animals. New animals should be quarantined to ensure they are free from any disease. Feed control is crucial in the prevention. It should be feed produced in the quality controlled food mills. The usage of non-recommended feed would prevent slaughter houses and dairy plants from purchasing the animal products.

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