

How climate change is affecting Wisconsin ^{PC}crops.

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BIO 171 Animal Biology

Lab section 2

Humans have only been on the planet earth for a speck of time, considering how old the earth is. And in that time we have managed to raise the global temperature with our pollutants, thus making the last 50 years the warmest in the last 1300 years (10). Now, some people do believe that the warming of the earth is a natural occurrence and it is, to a certain point (10). However, there are certain facts about earth's current climate changes that can't be over looked. For instance carbon dioxide levels, a heat-trapping greenhouse gas, have increased dramatically since the 1900s (10). Carbon dioxide is the main gas released when burning fossil fuels, which are burned constantly every day by millions around the world. People could then argue that carbon dioxide levels increase natural, which they have in past because of volcanic eruptions but, the fact that they have increased at a phenomenal rate that coincides with the start of the industrial era is a sure indicator that humans are the leading cause for the current climate change. Because the earth is warming up its caused numerous problems worldwide for people, animals, and plants. Global climate change has and is causing glaciers to melt at nine percent per decade, causing the sea levels to raise and creating a huge problem for arctic animals like polar bears who mainly live on the ice(1). The glaciers melting in the Himalayans is also affecting the clean water supply for the thousands that live there (1). Global climate change is now even seen affecting crops around the world, including in Wisconsin.

Within the past few years Global climate change has really begun to show itself in Wisconsin weather, affecting everyone in the state as a whole and tremendously affecting the agriculture of the state. In the past, the summer months of June, July, and August would experience frequent and light rain fall, with few heavy down-pours (4/1). But now with our changing weather patterns Wisconsin is experiencing less frequent rain fall in the summer months and when it does rain it's in very heavy down pours (4). The heavy down pours and less rain is affecting Wisconsin crops hugely and according to scientists from UW Madison the annual rain fall has increased by 3 inches(4). When any crop is planted, like corn for instance moisture in the ground is extremely important to the plants development. Not

enough moisture or too much moisture can cause the seedling to die before it emerges (8). If Heavy down pours occur during or right after planting season the intense amount of water can cause the seedling to rot in the ground, this affects the overall crop yield of the farm. Excess water can also erode vital nutrients in the soil, which the plant needs to maintain healthy growth (6). Throughout the state there is variation of rain fall, for instance northern and northwestern Wisconsin are likely to be dryer compared to the western and southern parts of state which are seen to have wetter conditions (6). So the crop yield and the conditions affecting the crops will be different throughout the state. But one thing remains certain precipitation is a major influence for any crop and it can make or break a crop.

Weather change has also dramatically affected the growing season of crops in Wisconsin. According to the United States Department of Agricultural Statistics Service In 1996 Wisconsin corn farmers would usually start planting crops around April 25 and start the harvest by October 1st. Wisconsin farmers who plant oats to feed cattle would start to plant their crop around April 1st and harvest in July. With the dramatic weather change Wisconsin has undergone the start of growing season and harvest season are complexly different. According to statistics done by the WICCI the growing period has actually lengthened in northwest and central Wisconsin by 2 to 3 weeks but state wide it's increased by 12 days. However, the increase of growing season depends largely on where in Wisconsin, when the last frost is, and what happens to be the weather pattern that year (4). Frost can harm a crop if it has already sprouted but, if the seedling has just been planted then it will have enough soil on top of it to insulate it and protect it (6/4). Most farmers wait until after the last frost to avoid any unnecessary loss of crop. According to the recent article on Corn Agronomy the last frost for Wisconsin varies greatly throughout the state, in the north the last frost doesn't occur until sometime between May 30 and June 6 and in the southern part of the state not until end of April and beginning of May (4). So the growing period may have lengthened for the state as a whole because fall is beginning later in the south, thus signaling the last harvest season.

One of the biggest challenges farmers have to overcome isn't just the weather but also the insects and fungi that make a meal out of crops. The Nature: International Weekly Journal and Scientific American both state that more crop pathogens, insects, and fungi are moving north due to global warming. Certain pests in the south of the U.S. stay in the south because of the cold of fall towards the north but because of climate change the pests have an open window between the end of summer and beginning of fall to move north. One major crop pathogen called *PHYTOPHTHORA INFESTANS* is causing scientist to worry because of its damaging history and cause for the famous potato famine in Ireland (8). As the crop pathogens, insects, and fungi move north its causing many farmers to worry about their future crops (8/11). So now scientists are looking to create pesticides and fungicides to help combat these new pests. These new pesticides and fungicides could help stop the pests from destroying the crops in Wisconsin and around the world but if the pesticide and fungicides aren't strong enough, the pests could become immune and continue to wreak havoc on crops (8/11).

In conclusion global warming is intensely affecting all of Wisconsin's crop growth. The less frequent rain fall and heavy down pours wreak havoc on the soil which the crops grow in. when there is little rain throughout a growing season the soil becomes brittle and less nutritious for the plants. This causes the plant to become weak and grow at a slower rate. Then in turn making it harder to harvest two crops per season, which is what some corn farmers do. Then with the poor, brittle soil, when the heavy down pours hit, it washes away some of the soil, exposing the bottom of the plant or the roots to pests and the heat of the summer. This can lead to a depletion in crop yield which then affects how much the farmer makes off of his crop. This extra stress on the crops will then in turn put extra stress on the farmers, who will have to work twice or three times as hard to keep his land and family feed.

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