Global Climate Change calls for Universal Agricultural Adaptations!

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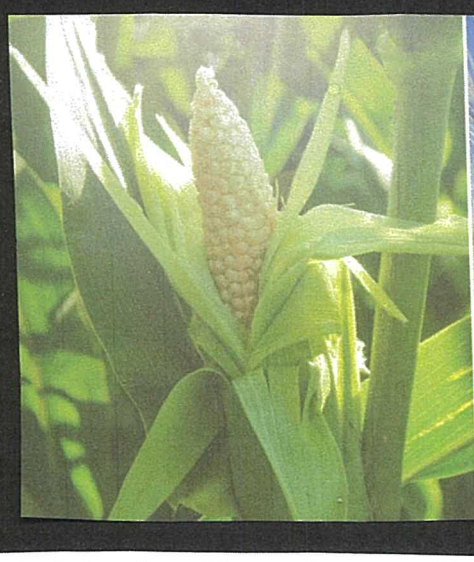
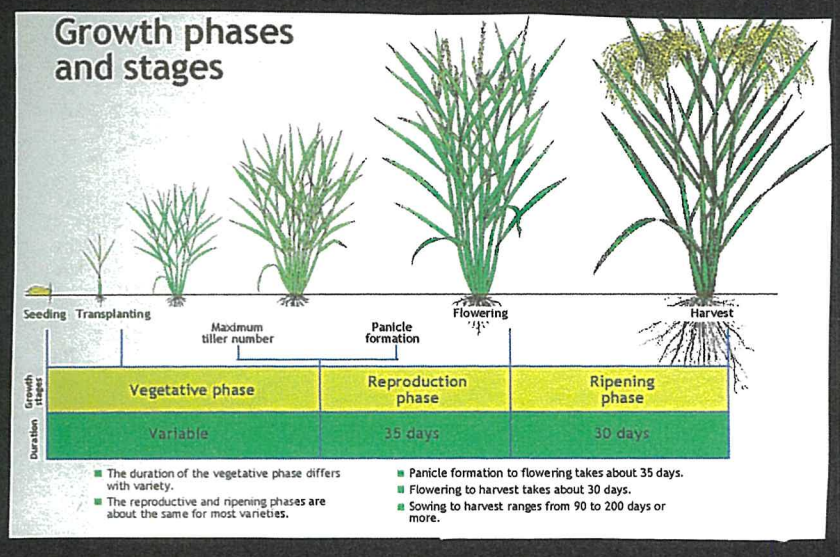
With recent advancements in the industry, scientists are noticing new climate trends that are starting to alter the way we plant, grow and harvest our crops. The by-products created from industrial development, such as carbon dioxide and other greenhouse gasses, have risen dramatically over the past decades, leading to heavy modification of farmlands. The sudden increase in temperatures demands a change in location where the crops are planted and the elevated carbon dioxide levels could affect crop growth and grain yield.

How does Agriculture affect crop Production?

A recent study conducted by the UN Food and Agriculture Organization (FAO) states that due to rising temperatures, rising sea levels and a higher frequency of extreme weather events, there will be a definite decrease of agricultural production productivity in several regions around the world. The arrival of greater carbon dioxide concentrations meant a decline in staple crop production such as Maize and Wheat crops. On average, there is a 7.4% decrease in the production of Maize crops while there is 6.0% decrease in the production of wheat.



According to the meteorological data from Korea, the most efficient climates for rice ripening and production is an average of 21~23 degrees celsius, which was around August 15 in the 1970s. But in the 2000s, with climate rising, the ripening week was delayed to August 21. Additionally, the climates have risen an extra 2 to 3 degrees celsius, meaning that the rice crops cannot ripen fully or properly. This can affect the rice production in, since the rice grown in these climates contain more protein, become less tasty and nutritious. This affects the production rate of rice in Korea.



According to this diagram, the Ripening phase, as well as the Reproduction phase are heavily impacted by climate change. Some crops might only have 2-3 weeks to fully ripen, while batches that fulfill the whole ripening phase are rare and often costly. This is due to the inefficiency of crop reproduction due to the Reproductive phase.

Temperature and soil moisture are big factors that must be considered during the reproduction phase. Both factors are also heavily impacted by the effects of climate change.

Acknowledges and References:

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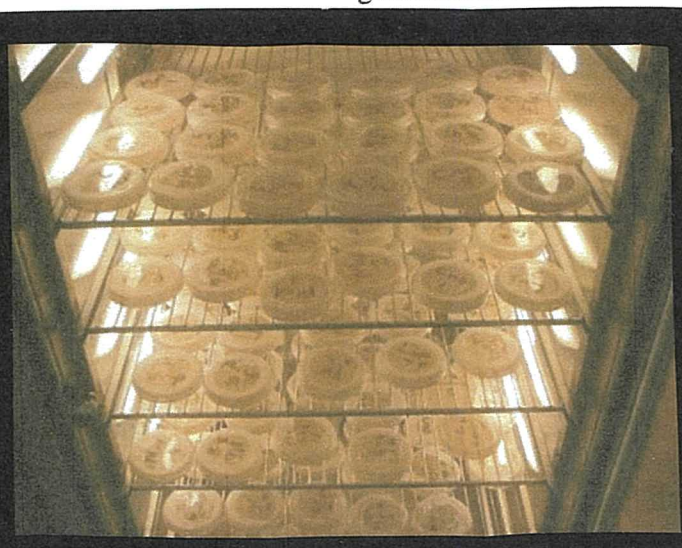
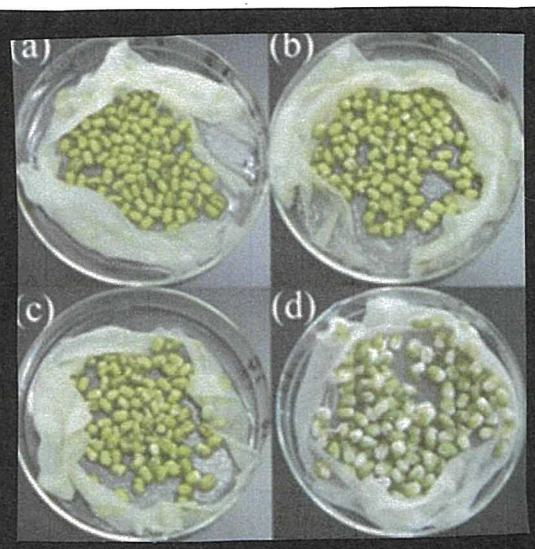
What are some ways farmers have adapted to climate change?

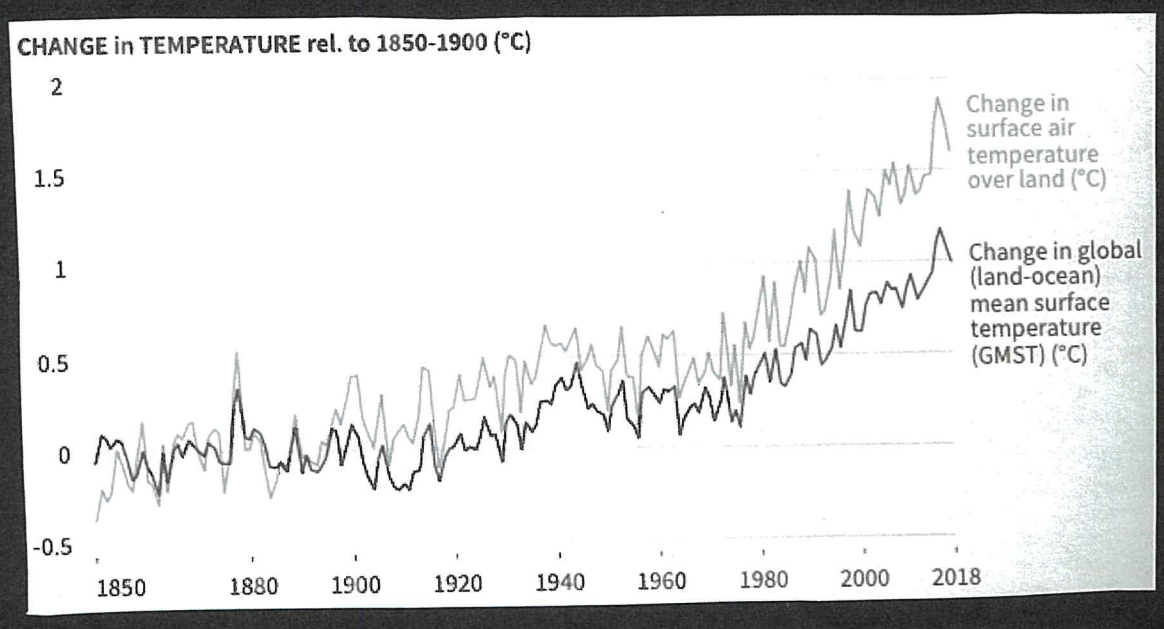
As of right now, scientists are still researching efficient ways to avoid the changing climates for the long-term future. One of the ways they have done this is through the integration of new technology systems into agriculture. Further research has been put towards the establishment of seedlings called "Quality Seeds" that are resistant to drought, high salinity levels, large amounts of water and suitable in hot or colder weather conditions. Furthermore, farmers and scientists have looked into interfering with the growth of seedlings throughout different stages of growth. For example, putting seedlings through higher frequencies of frosting when in the pollination stage or putting them through higher temperatures at the grain-filling stage to further stimulate seed germination.This is done through seed incubators.



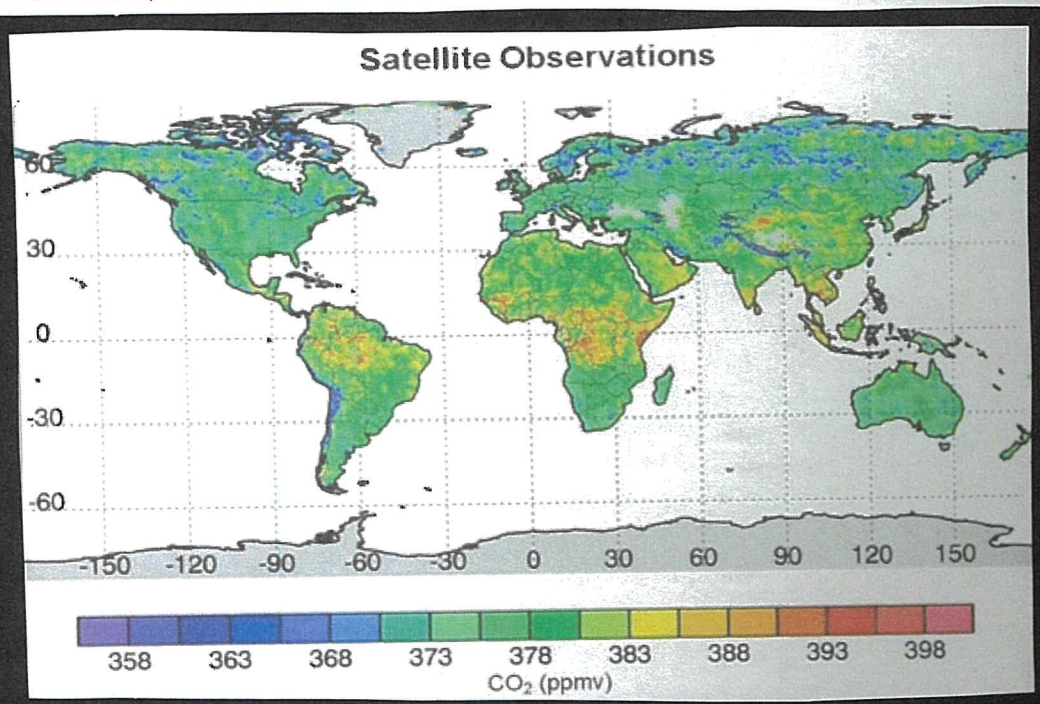


How does Climate Affect Agricultural Lands?

Since the pre-industrial period, the air temperature has risen almost twice as much as the global average temperature. From 1850-1900 to 2006-2015, the average mean land surface air increased by 1.53 degrees celsius.



Climate change has negatively affected terrestrial ecosystems and contributed to land degradation and desertification. This means that gradually, more farmland is drying up due to the changing climates and is no longer able to be used for farming. The frequency and intensity of droughts has increased in some regions, particularly The Mediteranean, West Asia, South America, Africa and North-Eastern Asia. According to satellite observations, vegetation browning had been observed occurring in some regions, especially Northern Eurasia, North America, Central Asia and the Congo Basin, usually due to increasing water stress.



Overall, Climate change can increase temperatures and cause more extreme weather to occur. This can negatively affect our crops and the farmland due to how it causes soil erosion and puts a decline in soil erosivity. We can also expect a rise in the sea level over the next decades, flooding many farms located in coastal regions.