# Two Part Study of Novel Ways to Alleviate Droughts Using Cloud Seeding Methods with Bacterial Ice Nucleators

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Last year, we made a conclusion that ice-nucleating bacteria could be an alternative to the chemicals that are sprayed in the atmosphere during cloud-seeding. However, we knew that some ice-nucleating bacteria are plant-pathogenic. This inspired us to try to find a defense mechanism that can fight pathogenic ice-nucleating bacteria. This defense is bacteriophages, or viruses that kill off bacteria. For our experiment, we obtained river samples from which we derived the viruses from. Then, we plated the virus sample on a plate that already had a TPL2 or Cit-7 bacterial lawn on it. Overnight, plaques, or little holes, formed on the plate, indicating that there are viruses that attack the bacteria. We took those viruses and retested to see if they are true bacteriophages of TPL2 and Cit-7. For our results, we found that there are no bacteriophages for either strain, but the plaques on the TPL2 plate were more transperant compared to the opaque plaques on the Cit-7 plate. This means that further research could be done in order to find bacteriophages for the TPL2 strain.

**Awards Won:**