

Hail—pieces of ice that form and fall from clouds instead of snow or rain—has always been a problem for farmers in some areas of the United States. Hail pellets can fall with great force and destroy crops in the field. Over the last few decades, a method of reducing hail, called “cloud seeding,” has been tried. In cloud seeding, the chemical silver iodide is sprayed on storm clouds from an airplane. This makes the clouds produce harmless rain or snow instead of hail. Several pieces of evidence suggest that cloud seeding has been effective in protecting crops from hail. Laboratory experiments Experiments in the laboratory support the idea that cloud seeding is effective. Hail usually forms in water vapor that is close to the freezing point. However, when experimenters added silver iodide to cold water vapor in the laboratory, they often observed light snow forming instead of hail pellets. Evidence from Asia There is evidence about the effectiveness of cloud seeding from several countries around the world. In some Asian countries, for example, cloud seeding has been successfully used to control precipitation in urban areas. These positive results suggest that cloud seeding should also be effective in protecting fields and farms in the United States. Local studies A few local studies also support the value of cloud seeding. One study conducted in a farming region in the central United States, for example, directly monitored crop damage due to hail. The study found that in an area where cloud seeding was used there was reduced hail damage compared to previous years.

Now listen to part of a lecture on the topic you just read about. It’s not clear that cloud seeding is all that effective and there are reasons to question each of the arguments you just read. First, it may be true that under laboratory conditions, silver iodide creates snow instead of hail. However, in real life, silver iodide can actually prevent any precipitation at all from forming in the clouds—snow, rain, or hail. This is a bad thing, because if you seed all the clouds in areas where it doesn’t rain very often, you run the risk of causing a drought. In this case the crops simply get damaged for a different reason—lack of water. Second, it’s not clear that the positive results with cloud seeding in Asia can be repeated in the United States. The reason is that cloud seeding in Asia was tried in urban areas—in cities. And cities tend to have a high level of air pollution—from car traffic, industry, etc. Surprisingly, pollution particles can create favorable conditions for cloud seeding, because they interact with clouds and the seeding chemicals. Such favorable conditions for cloud seeding may not occur in an unpolluted area. This means that the cloud seeding method that works in polluted cities may not work in unpolluted farming regions in the United States. Third, the local study mentioned in the passage isn’t very convincing either. That’s because the study found that hail damage decreased not just in the area where the cloud seeding actually took place, but also in many of the neighboring areas to the east, south, and north of that area. So, the fact that the whole region was experiencing a reduced number of hailstorms that particular year makes it more likely that this was a result of natural variation in local weather and had nothing to do with cloud seeding.

Summarize the points made in the lecture, being sure to explain how they respond to the specific points made in the reading passage.

Do you agree or disagree with the following statement? For the successful development of a country, it is more important for a government to spend money on the education of very young children (five to ten years old) than to spend money on universities. Use specific reasons and examples to support your answer.