

Semi-annual Weather Modification Association Meeting: Santiago, Chile 2013

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ABSTRACT: The semi-annual meeting of the Weather Modification Association (WMA) was held in Santiago and La Serena, Chile on the 25, 26 and 27 of September 2013. The National Irrigation Commission of Chile worked closely with the WMA to organize the meeting. Chile's Agriculture Undersecretary, Alvaro Cruzat, inaugurated the meeting by stressing that it was important for Chile to host the WMA meeting. Hosting the meeting allowed the presentation to the global community the results achieved by Chile's cloud seeding program. Ten international leaders in the weather modification community presented invited talks during the meeting. The meeting had discussions of experiences, technologies and programs currently operating around the world. On Thursday 25 September 2013, attendees conducted a field visit to the Casablanca sector of Chile to visit a ground seeding site. Friday morning the meeting was concluded after a discussion about Chile's current and future cloud seeding program.

INTRODUCTION

During the 2013 Weather Modification Association (WMA) meeting in San Antonio, Texas, Philip Martin of Chile's National Irrigation Commission (CNR) proposed to hold a WMA meeting in Chile during the Fall of 2013. The WMA welcomed the opportunity and meeting plans were begun. The result was an international meeting of the WMA in Chile that was held simultaneously in Santiago and La Serena on 25, 26 and 27 September 2013. The September 2013 meeting was strongly supported by CNR since they were interested in hearing about the latest technologies and research in the Weather Modification field. This interest was the result of many years of drought in the Central and North Zones of Chile.

MEETING HIGHLIGHTS

After Chile's Agriculture Undersecretary, Alvaro Cruzat, inaugurated the 2013 Semi-annual WMA meeting (Figure 1), speakers presented a critical review of the design, implementation and evaluation of cloud seeding experiments. Mark Schneider highlighted the hail program in North Dakota,

United States. North Dakota's agriculture crops include wheat, barley, oats, sunflower, corn, flax, soybeans and dry edible beans. Schneider said that the cloud seeding program has a direct annual benefit between 12.0 – 19.7 million dollars, which is a benefit/cost ratio of between 15.7:1 and 25.6:1. Such a high benefit/cost ratio is why the producers themselves contribute to the program.

Roelof Bruintjes, from the National Center for Atmospheric Research, said several factors should be considered to determine if an area is viable for cloud seeding. According to Bruintjes, you need to start with considering the frequency of naturally occurring rainfall. Satellites and radars can be used to determine if the clouds are naturally efficient at producing precipitation. If not, you must find the right method for cloud seeding to enhance precipitation. Things to keep in mind are that for a cloud seeding program the initial investment is high since a lot of infrastructure, equipment, and skilled people are required.

Don Griffith gave a presentation on a feasibility/design study related to winter cloud seeding in northern Chile. Although Northern Chile does

not have many clouds, it is feasible to increase rainfall by 5 to 15% between mid-April and September using cloud seeding with aircraft. Surface generators would not be the most appropriate due to atmospheric instability in the area.

The importance of having trained professionals was addressed in depth by Arquímedez Ruiz, from Texas Tech University. Ruiz said cloud seeding programs which stimulate rainfall are a way to fight back against nature. There is a lot of stress on natural resources and cloud seeding helps to partially replace what has been taken from nature. He also emphasized that weather modification studies are very expensive and require several seasons of operations before results can be evaluated. Using statistics and radar observation is an economical way to show (not prove) that seeding impact is positive. Ruiz suggest that in Chile we need a network of radars to monitor the quality of operations and their effects.

CONCLUSION

Gary Walker, president of the WMA, said that all the information (investigations, operations,

analysis, etc.) covered during the meeting was important for people involved in Chile's weather modification program to understand. Agriculture Minister, Luis Mayol, led the closing day of the meeting and stressed that the aim of exchanging experiences and information was important so we have as much water as possible during drought periods. He noted further that having experts from WMA visit Chile to share knowledge was a good thing. The United States has the latest technology for cloud seeding and can be a true example for Chile in its efforts to promote a program of stimulating precipitation with public and private support in the areas most affected by drought. On Thursday September 25, members of WMA conducted a field visit to a Casablanca sector seeding generator site. The company, Hidromet, gave a brief demonstration of the generator's operations. The meeting ended on Friday 26 September after experts from the WMA met with public and private participants of the five programs conducting rainfall enhancement in Chile. After a brief overview of each program, discussions were conducted to provide recommendation for continuation of weather modification programs in Chile.



Figure 1: Image of Agriculture Undersecretary, Alvaro Cruzat, inaugurating the September 2013 Weather Modification Association's (WMA) meeting as WMA president, Gary Walker (in chair), and meeting attendee listen.