

AIR INFLATED SYSTEM FOR AN EMERGENCY ROOF

A Case History

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During the fall of 1971, the residents of Fort Collins, Colorado, thought sure the Wyoming line had been moved fifty miles to the south, because they were receiving more than their share of wind. . .almost as much as that neighboring state to the north considered normal. Even though it is considered abnormal, the Colorado State University Weather Station recorded only four days during December, 1971, when the wind velocity was less than 10 miles per hour.

The New Year was no exception. The wind had reached velocities above 30 miles per hour for seven of the first eleven days. On January 11 near tornado conditions occurred during the later afternoon and evening. The Colorado State University floriculture research greenhouses were to have the biggest test of their 23-year life. At 7:15 PM January 11 a power failure occurred with wind velocities reaching 70 miles per hour. Fortunately, the air temperatures during periods of high wind in northern Colorado usually range from 40 to 50° F. One could call them "fast" Chinook winds.

At the time, the greenhouse range was covered with an assortment of materials including vinyl film, PVC and FRP panels, and glass. At 9:30 PM wind velocities reached 110 miles per hour and the FRP panels on the south slope of one rose house were completely and neatly removed. The wind subsided at dawn, January 12, with the temperatures at 42° F. Plans for recovering the house were made. Sufficient FRP panels for such a large project were not on hand and there was no time to get materials from Denver. The weather bureau predicted a cold front within hours.

Some months before the "big blow," the Monsanto Chemical Company had supplied us with enough "602" polyethylene film to cover two proposed experimental air inflated houses. Due to poor weather during the fall, only one structure was planned, and enough film to make an emergency air inflated roof was available for the rose house.

The staff and students started preparing for the new cover at 7:30 AM. By 8:00 AM the super structure was cleared, plastic film brought to the site, and wood for furring strips

obtained. At 8:20 a few flakes of snow started falling and by 8:25 the sky "opened up." More than one inch of snow was on the ground and the rose plants in the south half of the greenhouse took on a new look before the plastic could be pulled to the ridge and the "gaping" hole covered.

The temperature dropped 12° F in three minutes (See Fig. 1) and was below 20° F by noon. With the help of some very cold fingers, the double plastic layers were secured by 11:30 and the emergency roof inflated. Due to the cold, the plastic could not be stretched tight and on the warmer days to follow took on the appearance of a rather large balloon (Fig. 2).

The emergency cover was inflated to a pressure of approximately 0.2 inches of water pressure. Winds continued to blow during the winter and the new covering withstood

gusts up to 80 miles per hour. The cover remained on the house and was still in good condition in June when it was replaced with FRP panels. The 100' x 40', 6 mil polyethylene film had done its job in saving a \$6,000 rose research project.

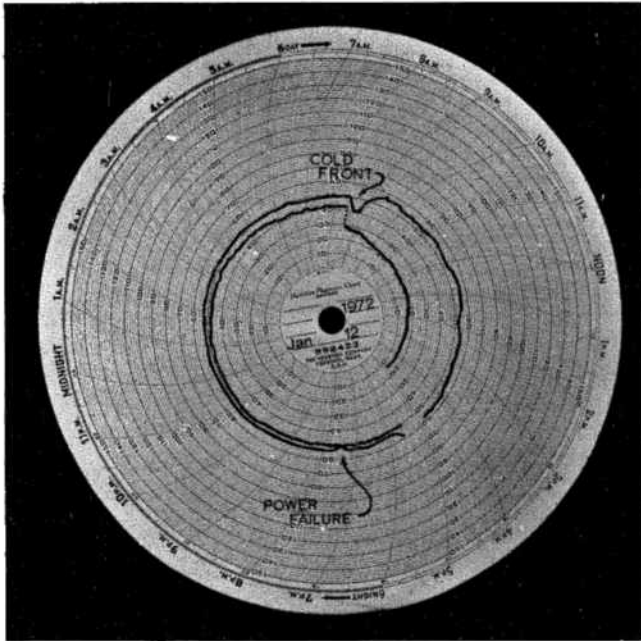


Figure 1

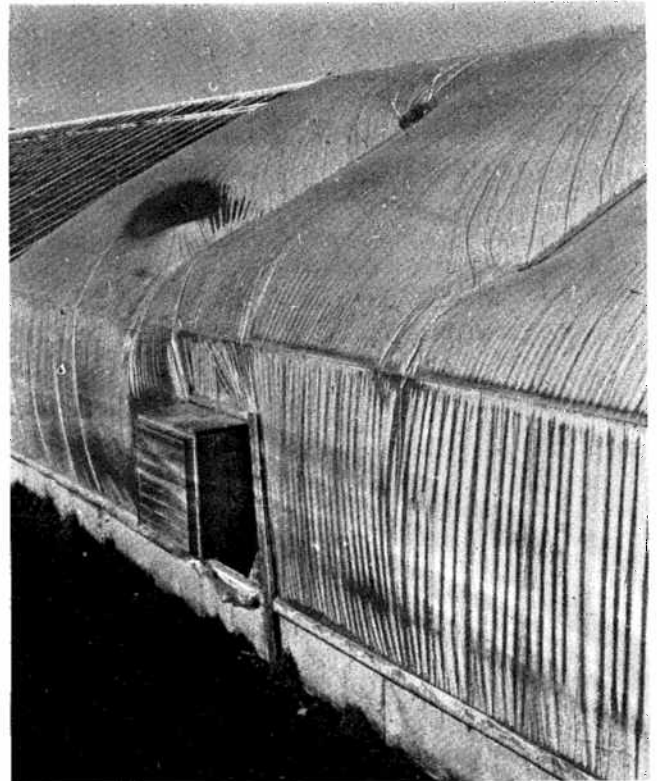


Figure 2

Your Editor,

W. D. Holley

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