



## Paper or Plastic?

Which bag will help prevent your house plant purchase from freezing in winter?

by

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We conducted a little experiment to find out what type of bag would best protect plants from freezing temperatures. This question causes a lot of debate each winter as temperatures plummet into the minus twenties and lower. Some people advocate paper, others plastic bags, and still others like the layered approach - paper plus plastic. There is also the complete skeptic who says, "wait until spring to make any plant purchase". We decided to test a variety of combinations on a cold, -23°F day in Fairbanks.

We purchased 30 tropical plants called ribbon plants (*Dracena* sp) from a local grocery store and brought them home in a styrofoam cooler to make sure there would be no damage. Jacob then assembled a variety of bags and a thermometer to test the following combinations:

1. paper bag - single layer
2. paper bag - double layer
3. plastic bag - single layer
4. plastic bag - double layer
5. paper + plastic - single layer
6. paper + plastic - double layer
7. no bag, plants kept indoors
8. no bag, plants placed outdoors

We placed one plant in a paper bag along with a thermometer. The bag was folded at the top and secured with a clothes pin. He took the bag outside for one minute, then returned to the warm, 68°F room. We recorded the drop in temperature inside the bag, then repeated this procedure with different plants for five and ten minutes. With the plastic bags, Jacob blew into the bags like a balloon, then tied them tightly. After all of the bag combinations had been tested, he placed all the plants in a tray and waited three weeks, watering them as needed. We evaluated all plants for damage and gave them a score ranging from zero to three, a zero score meaning no damage, and a three meaning dead (see footnote at bottom of Table 1).

The results surprised all of us, and the message is clear. Neither paper nor plastic is better than the other, even when doubled up or used in combination. All plants were injured if they were exposed to five or ten minutes at -23°F, regardless of bag type. (Table 1) Plants in the plastic bags showed slightly less injury than those in paper, but the damage was severe in all cases.

Inside all bags, the temperature dropped an average of 5 degrees to a minimum of 63°F after one minute from a room temperature of 68°F. In five minutes, the average drop in temperature was 20 degrees to a minimum of 48°F. After 10 minutes, temperatures dropped an average 37° to a minimum of 31°F. The ribbon plants were injured at temperatures above freezing after only 5 minutes of exposure! Like most tropical plants, they are susceptible to chilling injury and can die at temperatures well above freezing.

Therefore, if you want to buy house plants in winter, make sure your car is warmed up, and your plant is protected in either a paper or plastic bag. Be prepared to do a one-minute dash from the store to your car. Time is far more important than the type of bag in determining whether your plant is injured or not. If your car heater is not working, wait until spring to make plant purchases!

*Table 1. Rating of plant damage with six combinations of paper and plastic bags used to protect plants from freezing temperatures for 0, 1, 5 and 10 minutes.*

Bag type	Plant Damage Rating*			
	0	1	5	10 minutes
Paper- single	0	0	1	3
- double	0	0	1	3
Plastic- single	0	0	1	2
- double	0	0	1	2
Paper + plastic				
- single	0	0	1	2
- double	0	0	1	2
No bag	0	2	3	3

\* Damage rating: 0= no damage, 1= less than half of the plant damaged, 2= more than half of the plant damaged, 3= dead

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