

Pollen Storage

high viability of pollen obtained after storage in home freezer

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Hundreds of samples of deciduous fruit and olive pollen—used in breeding and artificial pollination studies—have been stored satisfactorily from one season to the next in an ordinary home freezer at temperatures ranging close to 0° F.

Samples of both hand-collected and bee-collected pollen were kept in vials stoppered with cotton plugs, unsealed fruit jars, and woden boxes. No attempt was made to control humidity.

The table on this page shows examples of pollen germinability after extended periods of storage in the home freezer. The percentages of germination might have been higher if there had not been

a power failure which prevented the freezer from operating for four days.

Method

The germinability of the pollen samples was determined every two or three months by testing it on a plate of an agar-sugar medium consisting of 15% cane sugar and 2% agar. The pellet pollen collected by the honey bees was dispersed in a few drops of freshly prepared 15% cane sugar syrup at the time of plating. A smear was then made of the pollen-syrup mixture on the agar medium. Experience has shown that higher percentages of germination are obtained

when fresh agar media are prepared for each testing, and when lids are kept closed on the petri dishes containing the agar-sugar medium and the germinating pollen to insure high humidity.

The success with which pollen was stored at temperatures far below freezing, indicates that the storage conditions for the various diverse species used by plant breeders may not be so specific as formerly believed. It further indicates that the storage life of many species might be greatly extended by temperatures ranging from those in home freezers down to those provided by dry ice.

The techniques of controlled or artificial pollination are no longer restricted to the research worker. Many orchardists are interested in the possibility of artificial pollination to insure a fruit set on self-unfruitful varieties which have been planted with inadequate facilities for cross-pollination.

Plant breeding has become an important profession and several commercial firms collect, cure, store, and sell various fruit pollens to be used in artificial pollination.

Results

Apple pollen from the pellets of pollen-collecting honey bees gave high percentages of germination after 12 months in a dry ice container held at approximately -59.8° F during studies in 1950. The dry ice container was kept in an ordinary home freezer which was adjusted to maintain a temperature between 5° F and -2.2° F. Control samples in the freezer—but not in the dry ice container—also maintained high germinability.

The ease with which pollen may be stored in the home freezer is advantageous since pollen storage at higher temperatures requires the maintenance of specific humidities and the use of either desiccators or other sealed containers.

Experimental work has been done to develop satisfactory methods of storing pollen to maintain high viability. Usually the studies considered the relation of pollen longevity to either temperature or humidity, or the interrelation of these factors. Pollen has most often been stored at temperatures ranging from 32° F to room temperature, and relative humidities have usually been maintained as either low or high. The low humidities have been attained with such drying agents as sulphuric acid or calcium chloride. Intermediate relative humidities between low and high have been attained with sulphuric acid-water mixtures.

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Pollen Germination after Storage in a Home Freezer at Approximately 0° F (Storage Periods Were between March 3, 1950, and May 11, 1953)

Kind of pollen	Variety	Germination near time of collection	Age of pollen	Germination
		%	days	%
Hand-collected Pollen				
Almond	Harriott	87.2	455	52.9
Almond	Lewelling	66.0	801	30.1
Apple	Rome Beauty	91.5	385	78.4
Apple	Golden Delicious	93.0	385	60.9
Apricot	Royal	...	440	8.4
Apricot	Prunus brigantina	...	402	58.4
Cherry	Black Tartarian	58.8	413	33.5
Cherry	Napoleon	47.3	408	39.9
Japanese plum	Burbank	36.4	437	32.2
Japanese plum	Wickson	42.7	441	38.2
Myrobalan plum	5Q	68.7	435	59.9
Nectarine	John Rivers	...	410	75.8
Olive	Manzanillo	27.5	379	35.5
Olive	Mission	39.3	367	28.8
Peach	Triogem	...	425	70.6
Peach	Florence	...	425	45.0
Peach-almond hybrid	C5-25H	79.0	430	72.7
Pear	Bartlett	68.5	408	56.5
Pear	Winter Nelis	84.7	408	73.6
Alfalfa	Common	87.8	34	73.0
Cantaloupe	PMR-45	98.1	30	98.0
Bee-collected Pollen				
Almond	Mixture	96.0	346	81.9
Almond	Mixture	98.2	813	54.1
Almond	Mixture	86.3	1,130	23.8
Apple	Mixture	84.6	384	33.9
Cherry	Mixture	26.1	276	19.7
Cherry	Mixture	32.4	743	26.4
Japanese plum	Mixture	...	412	20.7
Pear	Bartlett	64.7	369	19.8