

# F1 Hybrid Geranium Seed

## Effects of Media, Moisture and Fungicide on Germination

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In my thesis study of the germination of F1 hybrid geranium seed, many areas were researched including: temperature, long-term seed storage, media, moisture and fungicide seed treatment. From these studies, I would like to present a brief literature review and summary of the results of 3: media, moisture and fungicide treatment. The general method used for these trials was the same as that used in the temperature trials.

### MEDIA

The medium in which seed germinates can affect the germination of the seed. A fine textured, well drained, pathogen free medium such as Jiffy-Mix was preferred by Randolph (9) but a 1:1:1 mix of soil, peat moss and perlite could be used. The following media have been used for geranium seed information and are listed in descending order of superiority:

1. Redi-Earth, 2. peat moss or petri dishes and filter paper, 3. sand-peat moss mixture, and 4. Terralite. Pasteurization of the medium has been recommended.

Two separate geranium seed trials were conducted to determine the effect of media on germination percent and rate. All trials were carried on using saturated media - filter paper, sand, perlite, Zorb-all (turface), vermiculite and peat moss. An analysis of the germination percent indicated there were no differences between the media used. In both trials there were differences between the cultivars.

An analysis of the germination rates (germination resistance values) indicated there were cultivar differences in both trials. In the first trial, there were no differences between the 6 media, while in the second, peat moss was inferior to the other 5 (Table 1). In both cases, based on ranking of mean values, seeds on peat moss took longer to germinate than when placed on the other media.

According to these trials, satisfactory germination media for geranium seed were: sand, filter paper, turface, perlite and vermiculite.

### MOISTURE


There is an optimum medium moisture content for maximum germination percent and also an optimum content for germination rate. Under excess moisture conditions, stress may result from too rapid water uptake and from reduced oxygen availability.

Little data exist on water relations during geranium seed germination. Randolph stated that geranium seed is totally imbibed "... in as little as eight hours. Once the seeds have swollen it is extremely critical that they do not dry out." The use of overhead misters has been recommended by Adams (1) and Randolph (9).

Trials were conducted with sand using 2 moisture contents. The first consisted of 13 ml of water per 65 g of sand (free water on the surface) and 10 ml per 65 g. Moisture content did not affect the germination percent. As the moisture content decreased, the germination rate decreased. Geranium seed appeared to favour a media with available free water for germination. Decreasing the moisture content below this level increased the time required for germination to occur. Thus, as Gulliver and Heydecker (4) stated, there appears to be an optimum water supply for an optimum germination rate.

### FUNGICIDE

Seed companies are now selling seed which has been pretreated with fungicides to fight pathogens carried on the outside of the seeds. Longden (6) stated the "... pretreatment of seeds by wetting and drying ... uniformly improves the rate of seedling emergence." Using a thiram soak application, germination depression should not occur, but some Brassica L. seed lots have shown a decrease in germination as a result of using a thiram soak. Thiram is being applied to geranium seed by several seed companies.



Although some of the trials were designed specifically to test the effect of thiram on seed germination, it was also possible to extract information on this effect from experiments where temperature, media and water availability were under study as factors that influence germination.

In the majority of the trials it was found that thiram had no effect on either germination percent or germination rate (Table 2). In some of the trials, either the germination percent (Media trial I) or the germination rate (Temperature trial) or both (Media trial II) appeared to be strongly affected by thiram. In summary, there did not appear a consistent effect on either germination percent or germination rate.

#### REFERENCES

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Table 1: Mean germination resistance value in hours (time to 50% germination of the final germination percent to be achieved) for media Trial I and II, for 6 media.

Media	Mean germination resistance value	
	Trial I	Trial II
Filter paper	72.3 <sup>Z</sup>	46.7 a <sup>Y</sup>
Sand	72.5	45.9 a
Perlite	74.6	49.9 a
Zorb-all	75.3	51.0 a
Vermiculite	78.2	51.6 a
Peat moss	80.4	66.2 b

<sup>Z</sup> values do not differ significantly as determined by analysis of variance.

<sup>Y</sup> values followed by the same letter do not differ significantly as determined by the unpaired t test (0.05).

Table 2. Summary of the thiram treated versus untreated seed trials for germination percent and rate.

Trial	Germination percent	Germination rate
Thiram treatment	ns	ns
Temperature	ns	**
Media		
Trial I	**	ns
Trial II	**	**
Water content of medium	ns	ns

\*\* - highly significant by analysis of variance.

ns - nonsignificant by analysis of variance.