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an easy method for

GERMINATING FLOWER SEEDS

plus seed storage hints

circular 1077

University of Illinois at Urbana-Champaign / College of Agriculture / Cooperative Extension Service

An Easy Method for Germinating Flower Seeds —Plus Seed-Storage Hints

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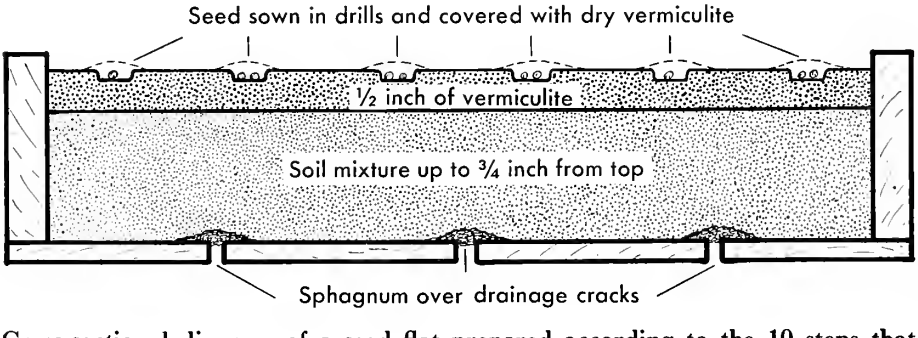
Home gardeners, as well as professional plantsmen, often have difficulty in successfully germinating seed indoors or in the greenhouse. Failure is frequently due to damping-off. But a poor seeding medium, improper temperatures, or sowing too deeply may also be responsible. The ideal seeding method should be easy to use, economical, and comparatively foolproof. One that measures up very well is described below. It has given consistently good results over a period of years with many different kinds of flower seeds.

A METHOD FOR GERMINATING SEEDS — 10 STEPS

This method utilizes both soil and vermiculite (heat-expanded mica). It takes advantage of the desirable properties of vermiculite for seed germination, while the soil supplies nutrients for the young seedlings. Vermiculite holds large quantities of water, yet retains perfect aeration. Furthermore, it is very light and easy to handle, and is also sterile because it has been heat-treated. The soil-vermiculite seed flat is simple to set up, and attractive from the standpoint of cost, availability of materials, and quality of seedlings produced. For consistently good results, follow as closely as you can each of the 10 steps outlined on the following pages.



Cross-sectional diagram of a seed flat prepared according to the 10 steps that are outlined in this circular.

After lightly covering drainage cracks or holes in container with sphagnum moss, add a well-prepared light soil mixture. (See Step 1.) Then level, firm gently, and thoroughly moisten. (See Step 3.)

1. Fill the container up to ¾ inch from the top with a screened light soil mixture, such as:

1 part garden soil 1 part shredded peatmoss or leafmold 1 part sand	OR	2 parts garden soil 1 part shredded peatmoss 2 parts perlite or vermiculite

A light mixture, such as one of the above, drains well and makes it easy to remove seedlings with a minimum of root damage — yet usually provides sufficient nutrients.

Conventional seed flats (wood, metal, or plastic), seed pans, or other containers can be used. Before filling, be sure to *lightly* cover the holes or cracks in the bottom with sphagnum moss to hold in the soil, but also to maintain adequate drainage. Arching pieces of broken pottery over drainage holes is also satisfactory.

2. Sterilize the soil and container if at all possible. At the same time, sterilize any tools or other implements that will come into contact with the soil or vermiculite during the seeding operation. By all odds, steaming is the most satisfactory method. It kills damping-off fungi and other disease organisms, as well as weed seeds, insects, and nematodes. Ideally, the soil should be moderately moist and held at 180° F. for 30 minutes. (Caution: plastic pots or flats may soften or disintegrate at this temperature.)

Where facilities for steam sterilizing are lacking, commercial formalin (37 to 40% formaldehyde in water solution) may be the answer. It is not as thorough, however, as steam or other forms of heat. Formalin can be purchased inexpensively at any drugstore. Use 2½ to 3 tablespoons to each bushel of soil; or 1 tablespoon to a 20″ × 14″ × 3″ flat of soil. Dilute the specified quantity of formalin with 4 times that amount of water, and mix thoroughly with the soil before putting it into the flat. The soil should be moist, about as for potting. Also keep it loose — don't tamp or pack it.

Place the treated flat of soil under a tight cover, such as a piece of canvas or plastic sheeting, for at least 24 hours so that the formaldehyde fumes will have time to act. Formaldehyde sterilization is best done when the air is fairly warm and the temperature of the soil to be treated is at least 65° to 75° F. Remember — the fumes are toxic, so keep them away from plants and animals. Be sure *all* fumes have left the soil before you do any seeding.

3. Level and gently firm the soil, then moisten it by sprinkling or by setting the flat in a sink or deep pan of water. When the soil is saturated, remove the flat and let all excess water drain away.

4. Pour vermiculite onto the soil to a depth of ½ inch and level carefully. For very small seeds, such as those of petunias, snapdragons, and begonias, use only a scant ¼ inch of vermiculite (see Step 6). Use the horticultural grade of vermiculite (about ⅛ inch in diameter). Do not pack. Vermiculite is quite free of disease organisms in the original package — try to avoid contaminating it. With a fine sprinkler, gently wet the vermiculite layer. Using a ½-inch strip of wood, make slight depressions ⅛ to ¼ inch deep in the moist vermiculite. These depressions, which should be about 2 inches apart, are the rows or "drills" into which the seed is sown.

Pour enough vermiculite onto the soil to make a ½-inch layer, level, and sprinkle gently; then make shallow "drills" about 2 inches apart. (See Step 4.)

(It is sometimes recommended that the container be filled entirely with vermiculite, using no soil. With this method it will be necessary to apply a dilute liquid fertilizer at frequent intervals once the seed has germinated. Vermiculite supplies some potassium and magnesium, but virtually no nitrogen or phosphorus. As a result, the seedlings soon become stunted and starved without fertilizing.)

5. Treat the seed with a protective fungicide, such as *thiram, captan,* or *ferbam*. These are common names for the materials, not trade names, and are listed under "active ingredients" on package labels. For each ordinary seed packet, use an amount equal to about a match head. Add slightly more to large packets. But don't overdo it — too much can be harmful. Balloon the envelope and shake vigorously so that each seed gets a light dusting. Seed treatment is one very important precaution against seed rot and damping-off.

Some firms supply seeds that are already treated, and this is usually indicated on the packets. Do not treat a second time.

Treat each packet of seeds with a fungicide, using an amount of powder about the size of a match head. Too much can be harmful. (See Step 5.)

Sow seed thinly and evenly in rows. (See Step 6.)

6. Sow the seed thinly and uniformly along the depressions. Tap the envelope with your forefinger to get the seeds to roll out at a uniform rate as you move the envelope along the row. Row-seeding is usually preferable to broadcasting because it permits better air circulation and makes it easier to remove the seedlings later.

When planting extremely small seeds, such as those of begonia or gloxinia, sift a *thin* layer of finely shredded dry sphagnum moss into the depressions. Moisten, then sow the seed directly onto this material. Don't cover the seeds, but it may be well to place a piece of glass or clear plastic over the flat to retain moisture. As germination occurs, gradually lift the covering.

7. Cover the seed with a light layer of dry vermiculite (except as mentioned in Step 6), the depth depending on the size of the seed. As a general rule, cover to a depth equaling about 3 times the seed diameter. With rather small seeds (for example, flowering tobacco, petunia, portulaca, and snapdragon), apply only a scattering of vermiculite particles *among* the seeds. Moisten with a fine spray or mist. A *very light* follow-up surface dusting with a 5% formulation of *captan* or *ferbam* is sometimes advised; these materials are safe, if used sparingly, and may help prevent recontamination.

8. Place flat in a draft-free room or greenhouse, preferably in a bright spot yet out of direct sunlight. Ordinarily, no glass or plastic covering on the flat is needed. Under a fluorescent unit, leave the lights on at least 18 hours a day. Note, however, that some kinds of seeds germinate best if kept in total darkness for the first 4 days (for example, calendula, cornflower, larkspur, nasturtium, annual phlox, sweet pea, garden verbena, and Madagascar periwinkle). Always look for special instructions on seed packets.

Most flower seeds germinate excellently in the temperature range of 65° to 75° F., although 60° is recommended for gazania and hollyhock and 55° is best for larkspur and sweet pea.

9. Water only as necessary. Remember that vermiculite holds a considerable amount of water, yet drains well. To be on the safe side, check moisture twice a day. Subirrigation is good, especially for small seeds, but a mist nozzle on the hose, a sprinkling bulb, or a watering can with a fine rose are quicker. Use water at room temperature and apply gently.

Cover seed with a thin layer of dry vermiculite, then sprinkle lightly. (See Step 7.) For germination of seeds, take flat to location where temperature ranges from 65° to 75° F. (See Step 8.)

10. Move the flat to a cooler location (55° F., nights; 65° to 70° F., days) when germination is complete to prevent soft, spindly growth. Choose a spot that is *well ventilated* and in *full sunlight.*

Ordinarily no fertilizing is required. For small seeds, you may need to make several applications of a complete liquid fertilizer at half-strength before the roots have penetrated down into the soil. One or two applications a week should be sufficient. Watch seedling development to see whether fertilizing is needed.

If damping-off occurs in spite of your best efforts, try to arrest it promptly by thoroughly treating the entire affected flat with a fungicide drench. Satisfactory drenches include *captan* 50% WP (wettable powder) or *thiram* 75% WP (1 tablespoonful per gallon of water); or *ferbam* 76% WP (7 teaspoonful per gallon). Both *PCNB* (*Terraclor*) and *ethazol* (*Truban*) are recommended, but use strictly according to directions. A combination of *PCNB* and *diazoben* (*Dexon*) is also quite effective. Read instructions on package labels carefully!

Transplant seedlings before they are overgrown like those in the wooden flat and the left-hand group of seedlings on the card. The other two groups on the card came from the metal flat. They are much smaller and will transplant with very little setback. (See Step 10.)

Transplant the seedlings as soon as they are big enough to handle conveniently. This is usually about the time the first true leaves appear between the seed leaves. Never let the plants become overgrown before pricking off into pots, bands, or flats.

Later seedings can be made in the same container by simply scraping off the top layer of vermiculite, loosening up the soil, resterilizing, applying new vermiculite, and seeding as described above.

Approximate Number of Days Required for Complete Germination, Using Method and Temperatures Recommended in This Circular

Plant	Days	Plant	Day
Ageratum	5–8	Gloriosa daisy	7–20
Annual gaillardia	15–20	Heliotrope	14–21
Annual phlox	8–10	Impatiens	15–18
Browallia	10–15	Lobelia	15–20
Calendula	6–10	Madagascar periwinkle	10–15
China aster	7–10	Marigold	5–7
China pink	5–7	Morning glory	5–7
Cockscomb	6–10	Nasturtium	7–10
Coleus	8–10	Nierembergia	12–15
Cornflower	6–10	Pansy	10–12
Cosmos	5–7	Petunia	6–12
Dahlia	5–10	Portulaca	6–10
Flowering tobacco	12–20	Red salvia	12–16
Four-o'clock	5–9	Snapdragon	7–12
Garden balsam	7–9	Spiderflower	7–12
Garden verbena	12–20	Sweet alyssum	4–8
Geranium	7–21	Wax begonia	15–21
Globe amaranth	5–15	Zinnia	5–7

HINTS FOR STORING SEEDS

It is usually wise to buy fresh flower seeds each season. Yet almost every gardener will have a few packets left from spring planting that he doesn't want to throw away. Or perhaps he has gathered seed of several varieties himself from the garden for later use.

It is seldom worthwhile to gather flower seeds from your own plants, *unless* you are certain the various kinds you collect will "come true." Many of them won't because of cross-pollination by insects or wind with other varieties growing nearby. And saving seed from choice F_1 hybrids (such as most petunia varieties grown today) almost always results in inferior plants that bear little resemblance to the parents in flower color, vigor, uniformity, or habit of growth.

Many kinds of seeds remain viable for a number of years — if stored under proper conditions. But merely putting them into a drawer

or tucking them away in a kitchen cupboard may result in disappointingly poor germination the following spring.

It should be pointed out, too, that seeds of some of our best-known flowers stay viable for only a year or so. Examples are annual phlox, China aster, coleus, garden verbena, red salvia, and wax begonia. Instead of storing these seeds, it may be wise to buy new supplies each year to be certain of a good stand.

Storing garden seeds under the right conditions can greatly increase their longevity. *They should be kept in a dry place and at low temperatures.* Reliable seedsmen find this to be good practice; as a result, seeds bought from them almost always germinate well. If they don't, you may want to call this fact to the firm's attention. But first be certain that you've given them a fair chance by using a good seeding method, such as the one described in this circular.

How and where to store seed. A gallon-sized glass pickle jar with an airtight cap makes a satisfactory container. Before storing seeds, let them thoroughly air-dry for several weeks. Do this when the relative humidity is low and the air temperatures are fairly warm. Then put the packets into the jar and tighten the lid to keep out air and moisture. Keep the sealed jar where the temperature will be in the approximate range of 35° to 50° F. — such as in a refrigerator, basement fruit-storage room, or cave.

Sow seeds as soon as possible after taking them from the jar; return the unused portions promptly. Close the lid tightly after removing packets, and put the jar back in its cool location immediately.

Test seed for germination. Before planting time, it's always a good practice to test the various kinds of seeds you have stored to determine how well they will germinate. Do this by placing a counted number of each, such as 50 or 100, between sheets of blotting paper or strips of muslin. Keep moist and hold at a temperature of 70° to 75° F. To prevent them from drying out, put seeds in a petri dish, a covered baking dish, or a pie tin covered with clear plastic.

Remove and count the seeds as they sprout. Make your final count at the end of several weeks when all have had ample time to germinate, and compute the percentage of germination. Even if the varieties you test don't germinate too well, you may still be safe in planting them if you sow somewhat more thickly than usual. Remember, however, that weakly sprouting seeds have little chance of surviving when planted in soil. If germination is poor, discard the seed and buy fresh.

The reward for your efforts . . .

Beautiful home plantings at very little cost

McFarland

Urbana, Illinois March, 1973

Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. JOHN B. CLAAR, *Director*, Cooperative Extension Service, University of Illinois at Urbana-Champaign.

10M—3-73—24338