

## DEPARTMENT OF THE INTERIOR

BUREAU OF EDUCATION, WASHINGTON

RAISING VEGETABLE PLANTS FROM SEED <sup>1</sup>

*Advantages to be gained.*—There are several advantages in raising from seeds such plants as lettuce, cabbage, tomatoes, peppers, and eggplants. In the first place, it is much cheaper to raise the plants than it is to purchase them. One ounce of any of the seeds mentioned will usually produce enough plants for the home gardens in an entire school district. Again, in purchasing plants there is danger of introducing into the garden soil certain diseases, such as club root of cabbage or wilt of tomatoes. Both of these diseases are widespread, and care needs to be taken not to inoculate the garden soil with them. Once these diseases become established, a long time is needed before the soil can produce a successful crop of the same vegetable. Infected plants may also introduce nematode worms into virgin soil. These worms live in the roots of lettuce, tomatoes, and cucumbers; they cause swellings that interfere with the passage of water and stunt the growth of the crop.

Another reason for raising plants from seeds is that select varieties can be secured in this way. There is also the advantage of having the plants on hand when the garden soil is warm enough to receive them and the weather conditions are favorable. Further, the gardener has the pleasure of watching the growing of the crop from the time of planting the seeds to the time of harvesting the products. This is a factor not to be minimized, for the successful gardener enjoys watching the growing plants and studying their cultural requirements and harvesting possibilities. There is also a market for these plants. Individual school gardeners in Asheville, N. C., and Chattanooga, Tenn., sold surplus plants in 1915 amounting to from \$5 to \$8.

*Time of planting seeds.*—In cities having the same planting schedule as Chattanooga the seeds of these crops can be sown from the middle of January to the first of February in shallow pots, pans, or flats. The planting season is proportionately earlier toward the south and later toward the north.

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<sup>1</sup> Prepared especially for the use of garden teachers in the South.

## FLATS FOR SEEDS.

*Preparation of flats.*—A flat is a box 3 to 4 inches deep by 12 inches wide and 16 inches long. It is filled with a layer 1 inch deep of leaf mold, topped with 2 to 3 inches of sifted garden soil. The best soil to use is made of one-third garden soil, one-third medium sand, and one-third leaf mold. These ingredients should be thoroughly mixed, then sifted to remove any stones. A soil sieve can be made by using the sides of a plug-tobacco box or any strong wooden box 8 by 10 inches both ways and 4 or 6 inches deep, and by tacking wire mosquito netting or one-fourth inch galvanized-iron mesh over the bottom. To prevent drying up, the soil should be pressed down to within 1 inch of the top of the box. A flat board 4 by 6 inches can be used for the purpose.

*Planting and care of flat.*—As soon as the flat is prepared, the seeds should be sown thinly in rows one-eighth of 1 inch deep and  $1\frac{1}{2}$  inches apart. The soil should then be leveled, a sheet of newspaper placed on the surface, and luke-warm water poured on it. The paper holds the soil in place and allows the water to pass through gradually. The paper may be left on the soil until the seeds have germinated, for it serves to check surface evaporation and makes watering easier. The flats may be kept in any warm room at home or school until the seeds have germinated. They should then be placed near a warm, sunny window and turned each day to prevent the plants being drawn toward the sunlight. Watering should be done with a brush broom or a fine spray, so as not to break or bend the tender plants. When the plants have their first pair of true leaves and begin to crowd each other, they should be transplanted into other boxes.

*Transplanting of plants.*—The fundamental principles of transplanting are: (1) The plants should be lifted with as much soil as possible, so the roots will become quickly established in the new soil. Watering the plants two hours before transplanting will insure sufficient soil adhering to the roots. (2) The hole must be deep enough to place the plant at the same depth it was before, and large enough to spread the roots out well. In transplanting, the soil should be placed a little at a time around the roots, care being taken not to get any in the crown; it should be pressed down evenly, not squeezed against the stem of the plant. Each transplanting prunes the long roots and causes the new ones to form in a close cluster. This makes the final transplanting into the garden soil a safe process.

## PLANT FRAMES.

By the first of March the plants may be transplanted into plant frames where soil moisture and temperature, as well as atmospheric conditions, may be partially controlled.

Each school gardener should have the plant frame ready for use by the first of March, for by this time the plants are large enough to crowd each other in the boxes and need to be transplanted again. The weather is also warm enough for the plants to grow outdoors under protection.

*Location.*—These frames should be located where they will not interfere with the regular garden operations, but where they will be protected by a hedge or building from the cold winds, and where they will receive the maximum amount of sunlight and have sufficient drainage.

*Construction.*—The size of a frame will depend upon the number of plants needed for the garden and the kind of sash used—whether a window sash or a regular hotbed sash, 3 by 6 feet. The frame is made of 2-inch boards, well seasoned. It is 12 to 15 inches high on the north side and 8 to 10 inches high on the south side. The slope insures removal of rain water and allows sunlight to reach more parts of the frame. The length and width of the frame depend upon the size of the sash secured for covering. The excavation is 18 inches deep, with a length and width corresponding to the inside measurements of the frame. The frame should be placed on top of the pit and the subsoil spaded up. The pit is filled as follows: 3 inches of coal cinders, 2 inches of leaves, 8 inches of fresh horse manure thoroughly packed and well watered, another 2-inch layer of leaves, 6 inches of rich garden soil, well packed and watered. The coal cinders and first layer of leaves provide drainage and prevent the filling resting on the cold subsoil. The decaying manure will furnish the bottom heat needed to make the plants grow. The second layer of leaves helps distribute the heat. The sash should be placed on the frame and allowed to remain three or four days. The frame will then be ready for use. (A fuller discussion will be found in School Home-Garden Circular 5.)

*Management.*—In the plant frame, the plants should be placed 4 inches apart in both directions. A piece of shingle  $1\frac{1}{2}$  inches wide is a good tool to make a soil mulch. An occasional thorough watering is far better than a sprinkling each day. Ventilation is the big problem. A beginner is likely to keep the frame covered too much. A safe rule is never to allow moisture to collect on the inside of the glass. At first, the north end of the sash should be propped up during the sunny part of the day. The height of the propping stick should be gradually increased until finally the plants are covered only on cold nights and mornings or during a drenching rain. Hardy plants stand transplanting better. On cold nights it may be necessary to cover the sash with leaves and burlap.

*Transplanting into the garden.*—Frequently the garden soil is too dry for successful transplanting. Under such conditions it is

better, first, to put the water in the hole and then put in the plant, rather than to pour the water on after the plant has been transplanted. Weather conditions may delay transplanting into the garden until the plants are very large; this is frequently the case with tomatoes. Large tomato plants should be put in a trench and covered with soil, leaving only the upper 4 inches of the stem uncovered.

*Plants for the early crop.*—A few plants of the earlier varieties of each vegetable may be transplanted into small flowerpots for the early crop. If these pots are kept in a warm, sunny window and given special care, then transplanted into a protected section of the garden as soon as outside temperature will permit, they will mature two to three weeks earlier than those started in the ordinary way. A gardener in Hartsville, S. C., planted seeds of Langdon's Earliana and Bonnie Best tomatoes in boxes in the house on January 1. When the plants had four to six leaves they were transplanted into larger pots. By April 1 they were in blossom and were transplanted into the garden. On June 1 ripe tomatoes were gathered. The gardener realized \$54.25 from three rows 250 feet long, in addition to the amount consumed by two families.

*Further use of frames.*—In the fall the frames can be very successfully used in growing winter vegetables. Lettuce, carrots, beets, onions, and cress can be profitably raised and marketed before the frames are needed for the growing of spring garden crops. This is also true of some of the flowers, especially pansies.

REFERENCES.

- United States Department of Agriculture, Washington, D. C. Farmers' Bulletins:
- 255. Home Vegetable Garden.
  - 647. Home Garden in the South.
- State Experiment Station Bulletins:
- Cornell University Agricultural Experiment Station, Ithaca, N. Y.:
    - Vol. II. No. 30. Hot-bed construction and management.
    - No. 33. Vegetable gardening.
    - No. 34. Home-garden planting.  - Virginia Truck Experiment Station, Norfolk, Va.:
    - The Home Vegetable Garden.  - Georgia Experiment Station, Experiment, Ga.:
    - Vegetable Gardening.