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Laurie Hodges

University of Nebraska--Lincoln, lhodges1@unl.edu

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Growing Seedless (Triploid) Watermelons

Laurie Hodges, Extension Specialist-Vegetable Crops

Seedless watermelons are gaining popularity as both their seeds and the mature melons become more available in the general market. These watermelons have excellent flavor and good disease resistance. They ship well due to a good, thick rind. The seedless melons may also have a longer shelf life than standard watermelons. Since there are few or no seeds to serve as loci of deterioration, the melons are slow to develop a mealy texture or become overripe. Yields are good, comparable to other melons in the 12-18 lb. range. The convenience of seedless melons is particularly attractive for restaurants and other food service establishments.

A basic understanding of genetics is helpful to understand how a seedless watermelon is created. Standard watermelon cultivars are diploid, and contain two sets of chromosomes, designated 2X. Seedless watermelons are triploid (3X) which causes them to be sterile, or seedless. The triploid seeds are created by crossing a normal diploid (2X) melon as the pollinator with a tetraploid (4X) parent. Each parent contributes half its respective chromosomes, 1X from one parent and 2X from the other. Maintaining the tetraploid parental line by treating seedlings with colchicine is the most difficult part of producing seed for the triploid watermelon. Because of the difficulty in maintaining the parental lines and the usual practices needed to produce hybrid seed, the seed for seedless melons is quite expensive, as much as \$150 per thousand seeds.

The triploid seed has a thicker seed coat than a standard diploid watermelon seed. Because of this and the expense of the seed, most triploid melons are started as transplants. Germination of the triploid seed is not as good as the standard cultivars even under the best of conditions. This should be considered when ordering seeds and planning production.

The following techniques will help ensure success in growing seedless cultivar transplants:

1. Use a light potting mix for good aeration.
2. Do not over water.

Both practices underscore the need to maintain good aeration around the germinating seed. All watermelons need more oxygen during germination than many other seeds. Transplant producers have found seedless watermelons to be even more sensitive to soil saturation than regular watermelon seeds.

3. If only a few seeds are involved, nick the rounded end of the thicker triploid seed (end away from the embryo) to increase the rate of water uptake and speed seed germination.
4. Seedless watermelon should be germinated at 85°F until at least 30-40% of the seedlings have emerged. Maintain soil temperatures at 70-80°F after germination.

Watermelon is a warm-season plant of tropical origin. Seed germination and plant growth are best at warmer temperatures.

5. Transplants should be 3 to 4 weeks old and have 2-3 true leaves when planted in the field. Older transplants suffer significant transplant shock.
6. Due to the demands of the triploid seed and high seed costs of roughly 10-15¢ per seed, direct seeding in the field is not economically feasible, even with precision seeding equipment. Breeders are trying to develop seedless cultivars with better germination and seedling vigor, but until then, transplants are the best approach.
7. Triploid transplants are very sensitive to cold injury and other stresses. Consequently, neither early germination nor seedling development are as vigorous as standard diploid seedlings. Once established, however, triploid watermelon seedlings show vigorous vegetative growth.
8. A little extra care goes a long way toward insuring success in early yield and quality. Plan for transplants to go to the field when soil temperatures average 65°F. Do not transplant before mid-to-late May in most of eastern Nebraska or before early June in western Nebraska. Growers in other regions recommend floating row covers to reduce wind stress on the young transplants. Floating row covers also serve to warm the air and soil around the covered melons.
9. Under stress conditions, some hard, black seeds may develop even in the "seedless" watermelon. Seedless cultivars do have small, soft, white seeds, which most frequently occur on the fruit in the crown set. Some growers recommend advertising the melons as "virtually seedless" to warn consumers of the occasional hard, black seed.
10. Irrigation is highly recommended. Watermelons should never suffer water stress. Because of their high water requirement, yields will be greatly reduced if they experience water stress during fruit formation or development. If necessary, use irrigation during stand establishment, as well as during fruit development.
11. Seedless watermelons are triploid and are self infertile and therefore a standard diploid cultivar is required for pollination. Usually a cultivar is selected with a similar or earlier maturity as the seedless melon, but with a different rind color or pattern so the seedless melons are easily selected out of the field. The pollinator cultivar can also be transplanted or directly seeded into the field one or two weeks earlier than the seedless cultivar to insure an adequate supply of pollen when female flowers develop on the triploid melon plants. A row of the pollinator cultivar should be planted for every two to three rows of triploid watermelon.

12. Adequate bee activity is critical for successful pollination. For more information, see NebFact 91-50.
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