HS1079

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Using In-Row Pollenizers for Seedless Watermelon Production[1]

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The popularity of seedless (triploid) watermelon has increased over the last decade. During peak watermelon production in the U.S. market in 2005 and 2006, seeded watermelons only comprised 22% of the market and averaged four to five cents less per pound (U.S. Department of Agriculture, 2005). When growers shift from seeded (diploid) watermelon production to seedless watermelon production, they must take into account that triploid (seedless) watermelon plants do not produce enough viable pollen to pollinate themselves (Maynard and Elmstrom, 1992). Hence, another source of pollen must be available to achieve acceptable levels of fruit set in the seedless crop. To achieve optimal seedless watermelon yields, 25% to 33% of the plants in the field should be diploid (seeded) (Olson et al., 2006; Fiachino and Walters, 2003; Nesmith and Duval, 2001). To ensure that the right number of plants are diploid, growers generally interplant a diploid cultivar in the same field to serve as a pollenizer, traditionally by using dedicated pollenizer rows. Typically, they plant every third or fourth row with a diploid cultivar. Generally the seeded and seedless watermelons are harvested separately unless rind patterns of the two are easily distinguishable. The use of diploid pollenizers in dedicated rows results in 67% to 75% of the watermelon plants per acre being triploid. It has now become difficult to market seeded watermelons, and few growers want to have a high percentage of their acreage in seeded watermelons. There are now dedicated pollenizer cultivars (commonly called special pollenizers) that are designed to be planted in-row with triploid plants. Commercially available pollenizers, their characteristics and sources are listed below (Table 1). The primary role of these cultivars is pollen production, and most do not produce marketable fruit. However, 'Jenny', 'Mickylee', 'Minipol', and 'Pinnacle' produce harvestable fruits.

At planting time, one crew punches holes and plants the field solidly with triploids. Then, another crew goes through the field and plants a pollenizer between every second and third or third and fourth plant. Here, the field contains 100% triploid plants. Most pollenizer cultivars are recommended to be planted at a 1:3 pollenizer to triploid ratio. This being the case, a pollenizer would be planted between every

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third and fourth plant within the row. Eliminating dedicated row space in the field for pollenizers increases the number of triploid plants and seedless watermelons harvested per acre. If a grower previously planted every third row with a pollenizer and then started using in-row pollenizers, their triploid plant population per acre would increase by 33% (Table 2). This fact must be taken into account when calculating input costs because triploid seed costs about three times more than diploid seed (Table 2).

Research at the University of Florida and Clemson University has been conducted comparing the effectiveness of seven in-row pollenizer cultivars based on seedless watermelon yields from plants pollenized by each cultivar. The following cultivars performed similarly and could all be expected to produce optimal seedless watermelon yields: 'Jenny', 'Mickylee', 'Patron', 'Pinnacle', 'Sidekick', and 'SP-1'. 'Minipol' was not tested but its growth habit is similar to 'Mickylee' and should perform comparably.

There are substantial differences in prices of pollenizers, so this must also be considered when choosing a cultivar. Most of the recommended cultivars can be easily distinguished from standard seedless watermelons (15-20 lbs) by their size, since most pollenizer fruit is small (Table 1). However, if a grower is producing mini or palm-sized seedless watermelons, a pollenizer with a distinctly different rind pattern must be chosen to avoid confusion during harvest. Most companies that produce triploid watermelon seed now produce pollenizer seed. If the pollenizers have been tested and found to perform well, it may be preferable for a grower to have a pollenizer and a triploid from the same company. Even though the pollenizers mentioned are effective, if a grower has a market for seeded watermelons, adoption of an in-row pollenizer may not be warranted.

References

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Table 1. Characteristics of Commercially Available Watermelon Pollenizer [z] Cultivars

Cultivar	Source [y]	Vine Type	Fruit Type
Jenny	Nunhems	Reduced vines, increased branching, thinner foliage	Round, jubilee type stripe
Mickylee	Various – Abbott & Cobb, Willhite, etc.	Standard	Round, gray
Minipol	Hazera	Slightly reduced standard type vines	Round, gray
Patron	Zeraim Gedera	Reduced vines, increased branching, thinner foliage	Oblong, gray with thin green striping
Pinnacle	Southwestern Seed	Reduced vines, increased branching, thinner foliage	Oblong, jubilee type stripe
Sidekick	Harris Moran	Reduced vines, increased branching, thinner foliage	Round, crimson sweet with dark background, very small size
SP-1	Syngenta	Highly branched, thin vines with reduced leaves	Round, light green with thin green striping

[z] Pollenizer refers to the plant that provides the pollen. This term should not be confused with "pollinator" which refers to the insect vector (bees) that transports the pollen from the male flower to the female flower.
[Y] Sources are provided for information purposes and should not be considered endorsements. Similar cultivars may be found in other reputable sources

Table 2. Plant population and plant cost analysis per acre using in-row pollenizers versus dedicated-row pollenizers

Input	Dedicated-Row Costs	Dedicated-Row Plant Populations	In-Row Costs	In-Row Plant Populations
Triploid	$ 272	1360	$ 91	1815
Diploid	$ 45	453	$ 363	605
Total	$ 317	1813	$ 454	2420

Values bases on 1815 plants/acre (8ft row x 3ft in-row)
1:3 Pollenizer to triploid ratio
$ 0.10 per standard hybrid diploid plant
$ 0.15 per special pollenizer plant
$ 0.20 for triploid plant