Asparagus Breeding: All-Male Hybrids in a Dioecious, Perennial Crop

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Breeding strategies for asparagus are influenced by its dioecious, perennial nature. Gender is controlled by a single locus, *M*, where male and female genotypes are *Mm* and *mm*, respectively. Development of *MM* supermales facilitates the production of all-male hybrids (*mm* x *MM* = *Mm*) which have a yield advantage compared those that are dioecious, as male plants are generally more productive than females. Longevity is an important trait for a perennial crop and a good asparagus cultivar should maintain high yields and survive 15-20 years. This requirement presents challenges and lengthens the timeline from crossing to commercial release. Additional traits important for selection include not only yield and disease resistance, but also spear diameter and tip quality, and 'replant resistance.' This presentation will review the main components of an asparagus breeding program and highlight the important considerations that distinguish this vegetable from annual field crops.