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# Somatic Hybridization and Applications in Plant Breeding

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## I. INTRODUCTION

Somatic hybridization of plants by protoplast fusion is a technique that has captivated the imaginations of plant breeders for three decades. It offers the possibility of accessing sexually incompatible germplasm between crop species and distant relatives, merging genomes of sexually dysfunctional cultivars or breeding lines, and substituting one cytoplasm for another with little effect on the nuclear genome. Since Carlson et al. (1972) first reported success with parasexual hybridization of tobacco (*Nicotiana tabacum* L.), hundreds of reports have been published to extend the procedures to additional plant genera and to evaluate the potential of somatic hybrids in many crops. Somatic hybridization has even been conducted under microgravity as part of a space lab experiment (Hoffmann et al. 1995). Using somatic hybrid as a key word in the on-line database (Web of Science) maintained by the Institute for Scientific Information, we found between 30 and 50 hits of primary literature per year for the last decade, indicating that interest in somatic hybridization as a plant breeding adjuvant has not diminished. Waara and Glimelius (1995) reviewed the literature on somatic hybridization through the early 1990s and somatic hybrids have been reviewed twice previously in *Plant Breeding Reviews*, once generally (Bravo and Evans 1985) and specifically for *Citrus* (Grosser and Gmitter 1990). The following review focuses primarily on literature published subsequently to the Waara and Glimelius (1995) review, with particular emphasis on the utility of somatic hybrids in plant breeding programs. A quick mention of the types of somatic hybrids possible and the methods used to obtain and identify them precedes our coverage of primary literature.