

P033 New frontiers in plant female reproductive biology
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Altering and controlling plant reproductive biology, from initial breeding crosses through commercial production of hybrid seed, has been the key to increasing productivity in numerous crops. Some manipulations, such as haploid induction technology, have increased the rate of genetic gain in crop improvement. Others, such as the use of cytoplasmic male sterility and the harnessing of nuclear male sterility, have led to more efficient production of hybrids and are enabling the next generation of hybrid crops. To date, these technologies have largely focused on manipulating male reproductive biology. Manipulating female reproductive biology has not been as prevalent. Clonal reproduction through seed, known as apomixis, has been a multi-generational pursuit amongst plant reproductive biology scientists for incorporation into crop plants. The potential to fix heterozygosity and to capitalize on perpetuated heterosis is a goal of increasing importance as the world's population continues to increase. The genetic basis of natural apomictic mechanisms remains largely unknown. Although deeper knowledge of plant female reproductive mechanisms is required to produce apomictic crops, several developments over recent years suggest that the engineering of apomixis may be on the horizon. The ultimate goal is an engineered, synthetic apomixis resulting in seed derived wholly from a maternal parent. We will discuss the new frontiers of plant female reproductive biology, tools to facilitate its research, modifications of its mechanisms, and how it can be harnessed to benefit crop production.