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In Vivo Haploid Production in Crop Plants: Methods and Challenges. Doubled haploids offer a rapid method of producing homozygous lines for accelerated breeding of varieties and hybrids

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In vitro techniques for haploid production: In the plant biotechnology programmes, haploid production is achieved by two methods. 1. Androgenesis: Haploid production occurs through anther or pollen culture, and they are referred to as androgenic haploids. 2. Gynogenesis:

Production of Haploid Plants

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successful in vitro haploid production in tobacco (Nitsch and Nitsch, 1969). Many attempts have been made since then, resulting in published protocols for over 250 plant species

The production of haploid embryos in vitro is a powerful tool for mutational analysis, as it enables the identification of recessive mutant alleles present in first generation (F1) female carriers following mutagenesis in the parental (P) generation.

Although several methods have been developed for producing haploid plants, the in vitro techniques are much more efficient than inter-specific hybridization or treatment with plant-growth regulators, temperature or irradiation.

Production of Haploid Plants (With Diagram)

In vitro haploid and dihaploid production via unfertilized

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Firstly, in vitro methods are based on the culture of haploid cells and their differentiation into haploid embryos and ultimately haploid plants. Both male (microspores or pollen) and female haploid cells (megaspores or ovules) are used, depending on the responsiveness of the cells in a given species.

In vitro culture of haploid cells of plants (e.g. pollen grains from anther and ovules from ovary) is possible. In vivo technique of haploid production includes the following: 1. Androgenesis: Production of haploid plants by development of an egg cell containing male nucleus. The female nucleus is eliminated before fertilisation.

Doubled haploids can be produced in vivo or in vitro. Haploid embryos are produced in vivo by parthenogenesis, pseudogamy, or chromosome elimination after wide crossing. The haploid embryo

is rescued, cultured, and chromosome-doubling produces doubled haploids. The in vitro methods include gynogenesis (ovary and flower culture) and androgenesis (anther and microspore culture). Androgenesis is the preferred method.

The 18 chapters making up In Vitro Haploid Production in Higher Plants are divided into two sections. Section 1 (eight chapters) covers historical and fundamental aspects of haploidy in crop improvement. Section 2 deals with methods of haploid production, including anther culture, micropore culture, ovary culture, pollination with irradiated pollen, in vitro pollination, and special culture

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What are the Techniques of Haploid Production

In vitro haploid production is among the new technologies that show great promise toward the goal of increasing crop yields by making similar germplasm available for many crops that was used to implement one of the greatest plant breeding success stories of this century, i.

In Vitro Haploid Production in Higher Plants: Volume 2 ...

Haploid production - SlideShare

In vitro induction of maternal haploids – gynogenesis:- In vitro induction of maternal haploids, so-called gynogenesis, is another pathway to the production of haploid embryos exclusively from a female gametophyte. It can be achieved with the in vitro culture of various un-pollinated flower parts, such as ovules, placenta attached ovules, ovaries or whole flower buds.

In Vitro Techniques to Produce Haploids 1. Anther culture : Most research has been carried out on isolated anthers which has been

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The two approaches are: (1) In Vivo Approach and (2) In Vitro Approach. Haploid plants are characterized by possessing only a single set of chromosomes (gametophytic number of chromosomes i.e. n) in the sporophyte. This is in contrast to diploids which contain two sets ($2n$) of chromosomes.

17 Haploid Cultures - USDA

Wu BJ, Chen KC (1982) Cytological and embryological studies on haploid plant production from cultured unpollinated ovaries of *Nicotiana tabacum* L. Act Bot Sin 24:125-129 Google Scholar Yang HY, Zhou C (1982) In vitro induction of haploid plants from unpollinated ovaries and ovules.

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In Vitro Haploid Production In Haploids and Doubled Haploids in Plant Breeding

vitro culture of immature male or female gametophytes. Biotech-

nologies provide powerful tools for plant breeding, and among these ones, tissue culture, particularly haploid and doubled haploid technology, can effectively help to select superior plants. In vitro haploid production is, thus, the most prolific and

Production of Haploid Zebrafish Embryos by In Vitro ...

In Vitro Haploid Production in Higher Plants - Volume 1 ... Haploid induction in plants: Current Biology

by a review of the factors that affect the successful production of androgenic and gynogenic haploids. Finally, some of the basic procedure used for the in vitro production of haploids will be summarized. Excellent discussions of in vitro haploid production, along with specific protocols for

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