Doubled Haploid Production from Spanish Onion Germplasm

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The use of doubled haploid (DH) in onion breeding is limited due to the low gynogenesis efficiency, and more specifically with the South European germplasm. Gynogenesis capacity from Spanish germplasm was evaluated and optimized in this study. Field plants produced a higher percentage of embryogenesis induction than growth chamber plants. A 2 to 3 times higher percentage of embryogenesis was obtained with a two-steps protocol than with a one-step protocol, 'Recas' cultivar showed the highest percentage (2.09%) and 'Fuentes de Ebro' cultivar the lowest (0.53%). The effect of different containers was tested and the highest percentage of acclimated plants was obtained with the two-step protocol in combination with Eco2box (70%). The application of 25 µM amiprofos-methyl in solid medium for 24 h to embryos produced the highest number of DH plants. Somatic regeneration from flower buds of haploid and mixoploid plants proved to be a successful approach for chromosome doubling. DH plants were produced from the four Spanish cultivars tested.