M. Fedak

Improved Androgenetic Response in Wheat (Triticum aestivum) as a Result of Gametocide Application to Anther Donor Plants

SCHMID J. AND KELLER E.R., Department of Crop Science, Swiss Federal Institute of Technology (ETH), 8092 Zürich, Switzerland

Induction of haploids as a realistic tool for wheat breeding demands an efficient in vitro system, adapted to a genetically wide range of material which is of present and future interest in wheat breeding programmes. We applied chemical substances (gametocides), which cause changes in the pollen development, in order to find factors which express better the possible predetermined androgenetic potential of donor plants. By means of a gametocide application, we screened for the dimorphic pollen (small, poor in starch), with the assumption that this type of pollen could have a good androgenetic response. The type of gametocide and above all the stage at which the gametocide was applied (spikes) as well as the concentration of the sprayed gametocide all play an important role. Embryo and plant production were high (up to 500 % embryos and more than 50 % plants, both in relation to the number of cultivated anthers) when 0.5 mg/l gametocide (CGA1) was applied to the donor plant (run-off treatment) when the spike had reached 1.5 cm in length. The variance between results within a single treatment can be explained by the numerous environmental and genetic factors which, together with the gametocide, produce varying effects.

High frequency plant regeneration through embryogenesis in haploid barley cultures

JENSEN,C.J.,and THÖRN,E.,Risø National Laboratory,DK-4000 Roskilde,Denmark,and Svalöf AB,S-26800 Svalöv, Sweden

Haploid cell cultures derived from immature haploid embryos of barley,Hordeum vulgare c.v. Golden Promise, and from immature anthers were reared and induced to form somatic embryos.Embryo initiation was high in primary and secondary cultures.Further development of the induced embryos into plants depended on the selection and specific protocol of transfer,medium change and rearing conditions. Almost half of the induced embryos could be grown into green plants.Depending on the time and growing conditions from the onset of initiation through to plant production a high proportion (more than 70 per cent) of the plants from the short-term cultures proved to be haploid.The long-term cultures showed increasing numbers of other ploidy.The results are the first start to a selection protocol for haploid barley cell cultures.They will also be incorporated in a basic study on recognising early events of somatic embryogenesis using monoclonal antibodies.