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RAJALA, ARI, PELTONEN-SAINIO, PIRJO,

Intra-plant variation for progress of cell division in developing oat grains: a preliminary study

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Abstract

Development of an oat panicle proceeds from the uppermost terminal spikelet downward to the base of the panicle. The intra-panicle variation in development is likely to influence potential grain size. This may result from differences in activity and duration of the cell division phase, vascular transport capacity, duration of filling period and/or hormonal balance. In this preliminary survey we studied intra-panicle variation in pollination (when clusters of pollen were visibly attached to stigmatic branches) of florets and cell division in developing grains immediately after pollination of the oat cultivars Belinda and Fiia. We found substantial intra-panicle variation for both traits. The highest cell number was found in the uppermost, most advanced, primary grain, while secondary grains tended to have fewer cells compared with their counterpart primary grains irrespective of their position. Results of an additional experiment indicated that death of the primary floret in the conventional oat cultivar Virma prior to pollination, resulted in higher weight of secondary grain, though this never equalled that of the primary counterpart. This limited growth capacity may partly result from lower cell number. These results encourage us to continue with experiments on the contribution of groat cell number to sink strength and grain-filling capacity.

Contact ari.rajala@mtt.fi

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