

# Induction of early flowering in poplar and in apple for a speed-up in disease resistance breeding

Stephanie Wenzel, Henryk Flachowsky, Viola Hanke

Julius Kühn-Institut, Institute for Breeding Research on Horticultural and Fruit Crops

stephanie.wenzel@jki.bund.de

Breeding of apple is a long lasting process. Apple plants go through a juvenile phase without the possibility of sexual reproduction and realization of crossing. The introgression of relevant traits i.e. resistance against diseases like fire blight, powdery mildew and apple scab, from wild species into cultivars with a marketable fruit quality by classical breeding is a time consuming task. Based on a shortened juvenile phase such important breeding processes could be realized within a more economical time frame. The introgression and over-expression of the *BpMADS4*-gene from silver birch (*Betula pendula* Roth.) into

apple (*Malus × domestica* Borkh.) resulted in a shortened juvenile phase. However, the expression of the gene driven by the constitutive 35S promoter from the *Cauli flower mosaik virus* led to an extensive production of flowers, which only could be counteracted by permanent elimination of dispensable buds by hand.

This project focuses on an induced and controlled early flowering by introgression of the *BpMADS4*-gene driven by the heat-inducible promoter *Gmhsp 17.5-E* from soybean (*Glycine max* (L.) Merr.) into apple (*Malus × domestica* Borkh.).