

# Breeding of Russian dandelion (*Taraxacum koksaghyz*) – From the wild type to a new resource for a sustainable rubber production

Helge Flüß<sup>4</sup>, Brigitte Ruge-Wehling<sup>1</sup>, Fred Eickmeyer<sup>2</sup>, Peter Wehling<sup>1</sup>

<sup>1</sup> Julius Kühn-Institut, Institute for Breeding Research on Agricultural Crops, Groß Lüsewitz

<sup>2</sup> AESKULAP GmbH, Steinach

Email of corresponding author: helge.fluess@jki.bund.de

Russian dandelion (*Taraxacum koksaghyz*) has the ability to produce and store high quality rubber in its roots. Due to the lack of alternative sources for natural rubber next to the Para rubber tree (*Hevea brasiliensis*), whose cultivation is problematic due to economical and ecological reasons, Russian dandelion provides an interesting new sustainable resource for natural rubber demanding industries.

Since Russian dandelion shows high diversity and relatively weak growth, it is still considered as wild type. This work aims to gain insights into the genetic background of this plant and provides important information for promising breeding programs in order to develop a new rubber producing crop.

As part of a network of different research institutions and private companies, the Institute for Breeding Research of the Julius Kühn-Institute is part of a value chain from breeding up to the finished product made of dandelion rubber. In close cooperation with a breeding partner, the comprehensive genetic variability of Russian dandelion

shall be used for the development of new varieties with high level and quality of rubber. On that account, different agronomic traits, such as the formation of a large, clear taproot with high contents of rubber, early and uniform flowering time, improved tillering in the first year of cultivation, as well as different disease resistances have been defined as breeding objectives.

These objectives will be supported by genetic analysis of different accessions of Russian dandelion and the development of a genetic map based on a defined mapping population. In order to develop sufficient SNP-markers for genetic mapping, a Genotyping-by-Sequencing (GBS) approach was applied. In combination with AFLP (Amplified Fragment Length Polymorphism)-markers, this high density genetic map provides a useful tool for mapping quantitative trait loci (QTL) related to rubber content and other important traits with regard to the development of selection markers for marker-assisted breeding (MAS).