Baptisia tinctoria (L.) R. Br.: From collection to field cultivation

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The Fabacea *Baptisia tinctoria*, known as Wild Indigo, is a widely branched perennial, which is found in Eastern North America. The use of *B. tinctoria* roots and rhizomes in traditional American medicine is well known, today the drug is an ingredient in immunomodulating pharmaceuticals, e.g. ESBERITOX® Schaper & Brümmer. The drug is still collected from its natural habitat in the US with the risk of diverse quality and possible falsification with related species. As *B. tinctoria* reproduces slowly, the natural ressources would soon be endangered. It was therefore prudent to establish an agricultural method for obtaining high quality material.

Traditional cultivation from seeds proved impractical due to their hardseededness and low germination rate. Therefore, *in vitro* propagation of plants had to be established. Seeds were collected from plants with high quality properties among the wild endemic plant population of Ohio/USA. They were scarified, surface sterilized and brought to germination within a week. From the plantlets subsequently obtained meristem cultures were prepared using stem cuts. Using this approach, mass propagation was established at an industrial scale. It is possible and actually done to produce large quantities of plantlets from a collection of elite-clones. The adaptation of the plantlets from *in vitro* to greenhouse conditions proved difficult. However, it was possible to improve the survival rate considerably over the last few years. Plantlets are now transferred to the greenhouse in March were they are held at high humidity and appropriate temperature. One of the selection parameters used at this stage of acclimatization is mildew resistance. The adapted plantlets are then transferred to the fields in May and cultivated for three years. Currently about 8-10 hectares are grown with *Baptisia tinctoria* according to GAP rules (´Good Agricultural Practice for medicinal and aromatic Plant Production´). Because of its very slow growth rate *B. tinctoria* is easily suppressed by weed. During the growth phase in summer manual weed control is obligatory monthly. After three-year-cultivation the roots are harvested. *B. tinctoria* produces roots as long as 70 cm. For the harvest a vibrating plough usually used in forest nurseries loosens the soil to a depth of 60 cm. The plants can be picked out of the soil manually, the roots are not injured or torn. After harvest roots have to be dried immediately. For this reason a 10 m² drying facility was built in which the roots are dried in a constant warm air at 35 °C. For transport and storage purpose the roots need to be cut in 5 cm pieces.

Since the *in vitro* culture, the *in vitro*/*ex vitro* adaptation procedure and the field cultivation have now been established, the main aspect of ongoing work is the selection and propagation of high performance clones leading to large yields of high quality drug.