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Generative propagation of Robinia x ambigua POIR. – Pink locust

Rédei, K[1]., Keserű, Zs[1]., Osváth-Bujtás[1], Z. & Malvolti, M.E.[2]

[1]Forest Research Institute, H-9600 Sárvár, Hungary
[2]Institute of Agro-environmental and Forest Biology, I-05010 Porano, Italy
E-mail address: redei.karoly@t-online.hu

Summary: The genus Robinia is a small group of about 10 species of trees and shrubs indigenous only to North America. Two species are endemic to Mexico, one being confined to south-western part of the country, while the rest are endemic to the south-eastern part of USA. Of the most important species and varieties of genus Robinia, Robinia x ambigua Poir.(Robinia viscosa x R. pseudo-acacia)-pink locust can be considered as the most significant one for bee-forage and decorative planting. In this paper a generative propagation method is presented for pink locust.

Key words: pink locust, seed management, seed orchard

Introduction

Of the four species of tree form of the genus Robinia, only Robina pseudo-acacia is of importance for forest management. Its breeding was initiated in Hungary by one of the leading plant breeders, R. Fleischmann. Superior tree groups have been identified in some seed grown stands. Graft material was taken from the plus trees and planted in test plots at Gödöllő (experimental station of FRI – Hungarian Forest Research Institute).

Mono-and multiclonal cultivars were developed and a seed orchard was established from the selections (*Keresztesi,*1988).

According to the basic selection goal, the improved cultivars can be classified into three groups:

- main goal: production of logs suitable for sawmilling,
- main goal: production of poles and props, and
- main goal: improvement of bee pastures and decorative planting. In this group 'Rózsaszin – AC' pink locust has proved to be the best (*Keresztesi,*1988; *Rédei,*1998).

Black locust forest is the basis for commercial honey production in Hungary. Between 1885 and 2005 the area of black locust forests steadily and rapidly increased. In 1885 there were only 37 000 ha of black locust forests in the country whereas by 2005 the area had increased to 410 000 ha. That is the reason why black locust has become the basis of Hungarian honey production. Agriculture with its large-scale production, utilizing machines and chemicals, largely precludes commercial honey production, but in good flowering years black locust provide 50–60% of the total honey harvested. This honey is of light yellowish colour with a mild flavour. A favourable feature is that crystallization takes place very slowly, sometimes only after a long time, in some cases even after some years.

The honey yield of 1 ha black locust forest during a rotation (30 years) covers the cost of establishment, which is about 4–7% of the returns for forest grown on good sites and 37–39% for those growing on poor sites.

From the point of view of bee-keeping, there are two types of black locust stands which ought to be favoured. The first is on marginal sites where the forest should consist of cultivars and cultivar candidates developed primarily for honey production. The second is on favourable sites where the dominant cultivars and cultivar candidates are dual purpose.

In Italy black locust is used primarily for erosion control and the existing black locust forests were regenerated by coppicing (*Fassi,* 1986).Black locust breeding work has also started, with the selection of relatively drought-tolerant clones for wood and honey production (*Malvolti,* 2002).

Pink locust is one of the most important cultivars for bee-keeping because of its late and long lasting flowering period and high sugar content of its nectar.

Description of pink locust

Origin: 6 plus trees were selected in forest subcompartments Gödöllő 86 B and 86 F owned by the local agricultural cooperative.

Characterization: The stem is slightly crooked in one and sometimes in several dimension. Growth is vigorous. Bark is smooth when young, steel-gray in colour with horizontal lenticels, later with fine cracks. Branches are strong, forming a large crown. Spines are tiny, particularly on thicker branches.

Leaflets are moderately densely arranged, dark-green with fine veins and a glaucous, greyish-green on the underside. The flower is pink, the calyx bears reddish dots

and is covered with tiny hairs. Inflorescences are of medium length (8–13 cm) and very densely packed with flowers (28 flowers per raceme on average. Flowering is regular and abundant, but date. Pink flowers appear among the well developed leaves. Flowering is one week later than that of common black locust, but its sugar value (SV) is 30–50% quarter on average. It is one of the most important cultivars for bee-keeping because of its late and long-lasting flowering period and high sugar content of its nectar (*Keresztesi,* 1988).

According to the cultivar test on good soil it characteristically has good stem development and dense foliage. Its stem quality is similar to that of the common black locust (*Figure 1*).

Figure1. Trial plot with 'Rózsaszín AC' locust at Gödöllő. Age: 14 years. *(Photo: ERTI Michalovszky)*

Generative propagation of pink locust

The large-scale production or propagation of pink locust is planned using seedlings. Therefore, a seed orchard was established by planting at Albertirsa (in the region of the Great Hungarian Plain). It can be found on sandy soil of medium and medium / poor quality at a spacing of 4x4 m. This orchard began to produce seeds at the age of five. Its seed yield varies between 3 and 8 kg/ha/yr (*Rédei, Osváth-Bujtás, Veperdi,* 2006).

After collecting the seeds in the orchard, they are taken to a forest nursery for rasing of seedlings. Seed beds for sowing need to be prepared with care. A table-smooth surface is the primary condition for sowing at the same depth. Germination of pink locust's hard shelled seeds is facilitated by pouring boiling water on them, by scarification, or by treating them with sulphuric acid before sowing.

Seeds prepared by one of the above-mentioned methods should be placed manually or by a machine in a grove 5–8 cm wide and about 3 cm deep. Sew 40–50 seeds of 100% germinative ability per running metre and cover soil with a layer 2–3 cm thick.

According to the general Hungarian experience, the distance between rows should be at least 35–40 cm. If the spacing is narrower, we should reckon with a decrease in growth. Also, if planted in narrower rows there will be a number of undersized seedlings with poor root systems, making them unsuitable for planting out. After the first vegetation season the expected size of seedlings is 40–90 cm in high and 5–12 mm in diameter at base (*Osváth-Bujtás,*1992; *Rédei ,Osváth-Bujtás, Balla,* 2001).

Pink locust seed requirements could be met from seed grown stands as well. In the course of establishing new pink locust seed stands, the suggested initial spacing is 2.5x1.0 m. Survey in the stands established for seed production will have to embrace the data relating to genetic value, health and seed-production capacity. It is recommended to manage the seed grown stands of extraordinary genetic value as gene reservations, and to preserve them up to the age of the highest possible.

Pink locust is very much suitable for establishing honey producing forest stands. When new stands are being established, large-sized seedlings are to be planted after the soil has been trenched. Initial spacing may be 2.5x1.0 m. The expected rotation age is 30 years on average.

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