

## How to establish a perennial legume-grass sward?

Arja Nykänen<sup>1)</sup> and Päivi Nykänen-Kurki<sup>2)</sup>

<sup>1)</sup>MTT Agrifood Research Finland, Environmental Research, Juva, Finland

<sup>2)</sup>MTT Agrifood Research Finland, Environmental Research, Mikkeli, Finland

Correspondence to: arja.nykanen[a]mtt.fi

The use of perennial legumes in swards is a key-factor in organic farming. Legumes are becoming more common also in conventional swards, because of their good characteristics like high yield without nitrogen fertilization. In many studies, the intake of fodder and milk production has been higher with legume-containing fodder than grass-only fodder.

Red clover (*Trifolium pratense*) has been the most common legume in perennial swards in Finland. Alsike clover (*Trifolium hybridum*) has been used more often in organic soils and white clover (*Trifolium repens*) is becoming more popular in pastures. Lucerne (*Medicago sativa*), yellow-flowered Lucerne (*Medicago falcata* L.) and goat's rue (*Galega orientalis* L.) are not yet common. They are recommended to get alternation with plant species in the field and fodder. The establishment of the sward is one of the most important farming practices. If that fails, it is difficult to get a well yielding sward. It is also important to get yield during the year of establishment.

In 2002, a field experiment with a split-plot design was established in Juva in order to compare the use of nurse crop to establish perennial legume grass sward in organic farming. A legume (red clover, alsike clover, white clover, Lucerne, yellow-flowered Lucerne and goat's rue) was used as a main plot. A nurse crop (threshed barley (grain harvest on 20 August), mixture of barley and pea (harvest as a whole-crop silage on 5 August) and no nurse crop) was used as a sub-plot. All legumes were sown in a mixture with tall fescue (*Festuca arundinacea* Schreb.). Yield of establishment year, its legume content and legume establishment as a number of plants were determined. Overwintering will be observed in spring 2003.

The barley grain yield (15% moisture) averaged 1 300–1 600 kg ha<sup>-1</sup> and the legume content of barley straw 33, 45 and 5% in swards of clovers, Lucerne species and goat's rue, respectively. Mean dry matter yield of legume grass mixtures without nurse crop varied between 2 000 and 4 000 kg ha<sup>-1</sup> and their legume content averaged 50, 73 and 12%, respectively. The legume content averaged 5 % in whole crop silage of barley pea mixture, except 20 and 0.5% in yellow-flowered Lucerne and goat's rue, respectively.

In autumn 2002, number of legume plants averaged 60, 75-80 and 40 plants m<sup>-2</sup> in swards of clovers, Lucerne species and goat's rue, respectively. In comparison with swards with nurse crops Lucerne and yellow-flowered Lucerne established the best without nurse crop (88 vs. 68 Lucerne plants m<sup>-2</sup>). Among other treatments threshed barley as a nurse crop favoured establishment of red clover (80 vs. 52 red clover plants m<sup>-2</sup>). Clovers and both Lucerne species established very well, but goat's rue emerged slower and more poorly.