# Italian ryegrass and barley mixture for forage production: effect of harvesting time on yield and quality in northern latitudes

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**Keywords:** cropping systems, Italian ryegrass, quality, whole crop cereals

**Introduction** In northern latitudes forage cereal and Italian ryegrass (IRG) mixtures provide a good source of forage in situations where perennial swards have suffered winter damages (Nissinen, 1994). In this experiment harvesting time of the first cut of an IRG-barley mixture was studied to optimise the yield and quality in the growing season. The objective of the study was to assess if harvesting an IRG-barley mixture later than two weeks after heading, as currently recommended, offers benefits.

**Materials and methods** An early barley cultivar was sown at a density 200 viable seeds/$m^2$ with IRG at 850 seeds/$m^2$ in Rovaniemi (66°35 N, 26°10 E) in Finland. The first harvest was taken: a) at heading of barley (H), b) two weeks after heading (H2), c) at early dough stage (ED), and d) at late dough stage (LD). Treatment H was harvested three times in the season in both years and treatment H2 three times in 2002 and two times in 2003. Treatments ED and LD were harvested twice in the season. N fertiliser application at establishment was 80, 90, 100 and 100 kg/ha for H, H2, ED and LD, respectively. Total N application in the season was 200, 200, 160 and 160 kg/ha, respectively. The plot size was 1,5 x 8 m. Experimental design was a completely randomised block with four replicates. Botanical composition was estimated on an approximately 1000 g sample taken from the harvested yield from each plot, and the yields were corrected to 100% DM based on the DM percentage of each component.

**Results** In 2002 first cut was taken 10.7., 23.7.,1.8., and 9.8. in H, H2, ED, and LD treatments. The last cut (2nd or 3rd cut) was taken 11.9. In 2003 the respective harvest dates were: 16.7., 30.7., 5.8., and 7.8., and the last cut was taken 11.9. The DM yield of IRG and ear and straw component of barley in the first cut and the total yields are shown in Figure 1. Share of IRG at the DM yield of the first cut ranged from 17 to 22 percent in 2002, and from 15 to 22 percent in 2003. Digestibility of organic matter (DOM) in the first harvest was 735, 699, 707, and 729 g/kg in 2002 in H, H2, ED and LD. In 2003 the DOM of ED was clearly lower (632 g/kg) than that of H2 (701 g/kg) and LD (697 g/kg) (Data for H is not available). OMD of regrowth of IRG was above 800 g/kg.

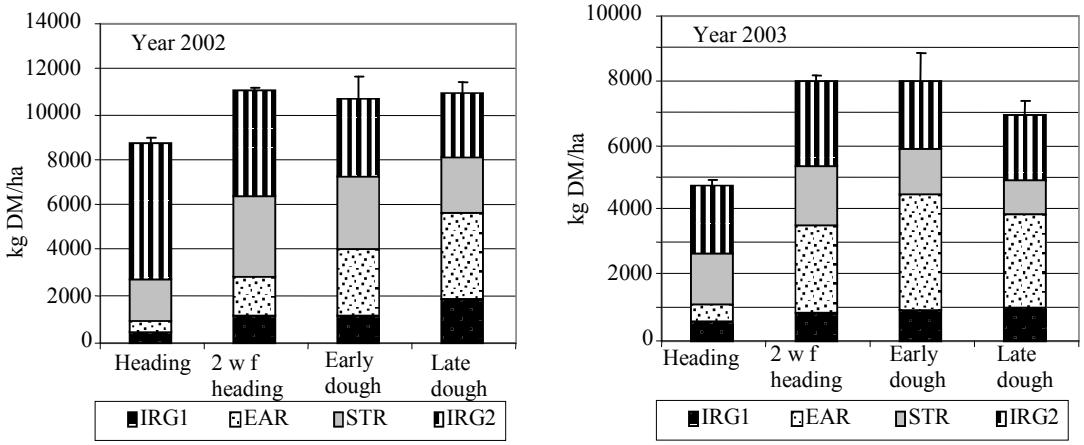


**Figure 1** DM yield of IRG, and ears and straw of barley in the 1st cut, and of regrowth of IRG2 in 2002 and 2003. The bars indicate standard deviation in the total DM yield

**Conclusions** The data indicate that harvesting an IRG-barley mixture later than currently recommended (within 2 weeks from heading) may provide benefits in production costs (fewer cuts). However, the quality of the first harvest requires more investigation. High yields can be obtained of IRG-barley mixtures.

**Reference**

Nissinen, O. (1994). The utilization of green forage plants in crop farming in northern Finland. In: C.A. Scott Smith (Ed). *Proceedings of the 1st Circumpolar Agricultural Conference* Whitehorse, Yukon, Canada September 1992. p. 115-116.