No trade-off between root biomass and aboveground production in *Lolium perenne*

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**Introduction**
Grasses have dense rooting systems, but nutrient uptake and drought resistance can be increased, and N-leaching reduced, if rooting is further improved. Improved rooting of grasses in agricultural systems should, however, not be a trade-off with aboveground biomass allocation and yield.

**Objective**
To investigate the relation between aboveground and belowground biomass allocation under field conditions.

**Material and methods**
- Two field experiments on sandy soil in The Netherlands: Experiment I, cutting regime; Experiment II, cutting/grazing regime.
- Eight varieties of *Lolium perenne* in each experiment, differing in aboveground and genetic characteristics such as productivity, grass cover and ploidy.
- Grass yield measured in years.
- Root dry matter in experiments.
Roots are important for soil quality

- Soil organic matter
- Soil biota
- Soil chemistry
- Soil moisture
- Soil structure
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Material and Methods

• Two trials of the Dutch Variety List for fodder grasses
  – Experiment I: mowing
    ➢ 8 applied \( Lp \) varieties
    ➢ 2 Production levels * 2 earliness classes * 2 ploidies
  – Experiment II: mowing + grazing
    ➢ 8 applied \( Lp \) varieties (other than in Exp. I)
    ➢ 2 Production levels * 2 soil cover classes * 2 ploidies

• Grass production during trials (3 years)
• Root biomass at the end of the trials
2 field experiments
16 commercial $Lp$ varieties

Varieties differed in root biomass
We found no trade-off with grass yield

It is possible to breed for high yielding grass with high root biomass