

# Phytoestrogens in red clover – ongoing research at NVJ

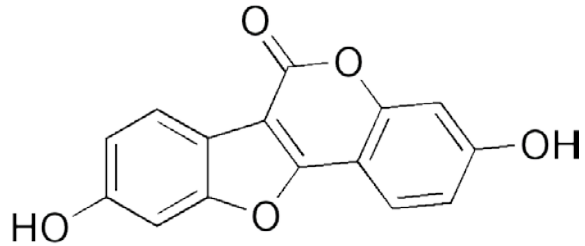
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LegSA, Umeå, March 25 2014

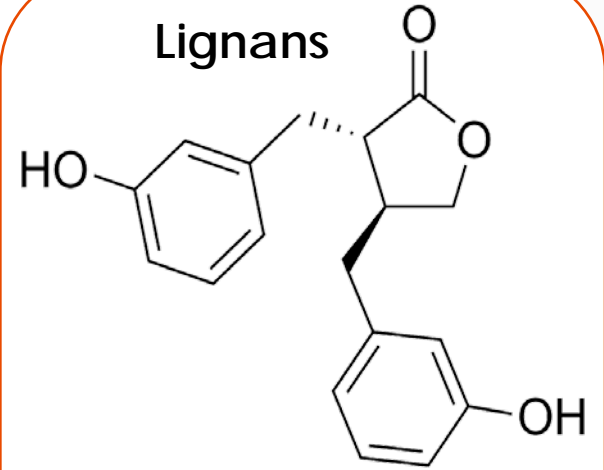


## Coumestans



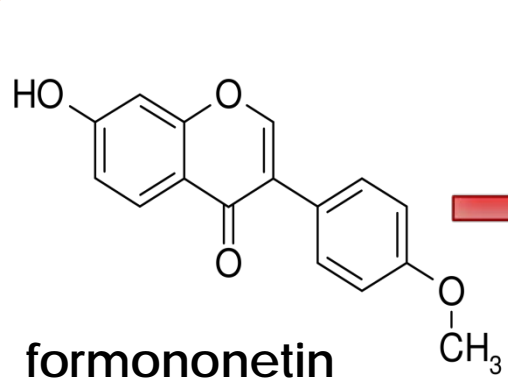
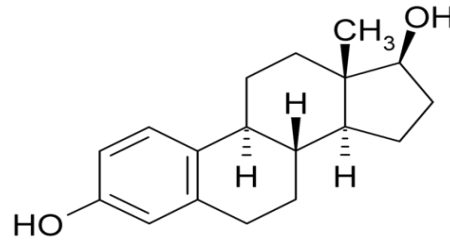
coumestrol

## Lignans



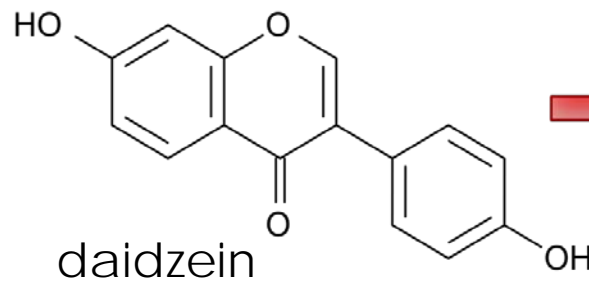
enterolactone

## 17 $\beta$ -oestradiol

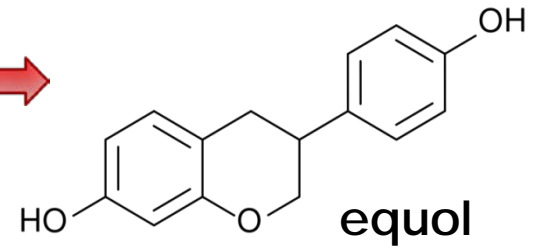


formononetin

## Isoflavones



daidzein



equol



# What is known?

- Red clover, subterranean clover, soy bean, lucerne, flax seed
- Mainly isoflavones in red clover
  - Formononetin and biochanin A
- Harvest time
  - Maturity
  - Leaf blade proportion
- Feed for sheep
- Feed for cows
  - Equol in milk

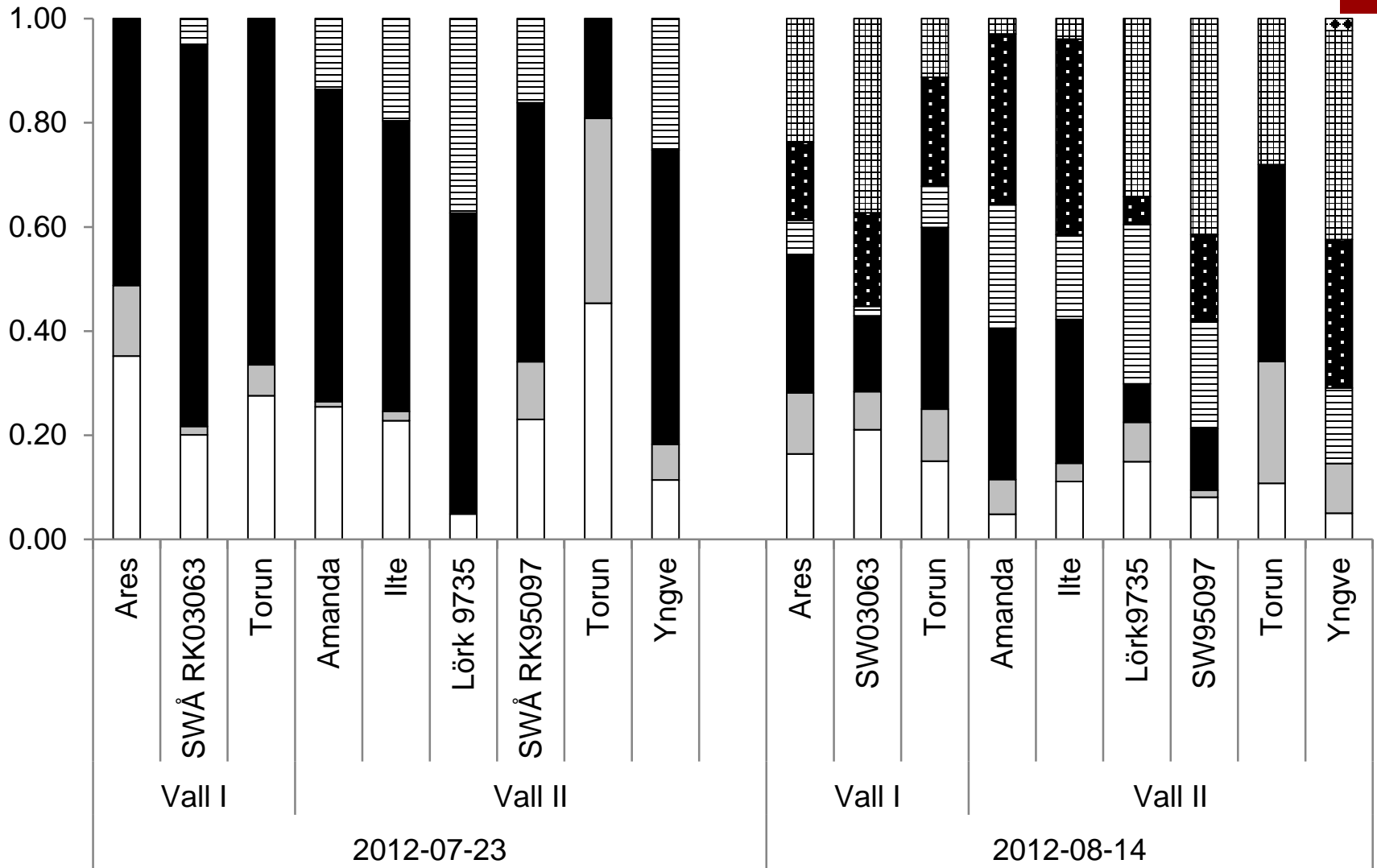
# Evaluation of red clover varieties

- Varieties
  - Amanda
  - SW Ares
  - Lörk 9735
  - SWÅRK 03063
  - Ilte
  - SWÅRK 95097
  - SW Torun
  - SW Yngve



Foto: A-M Gustavsson

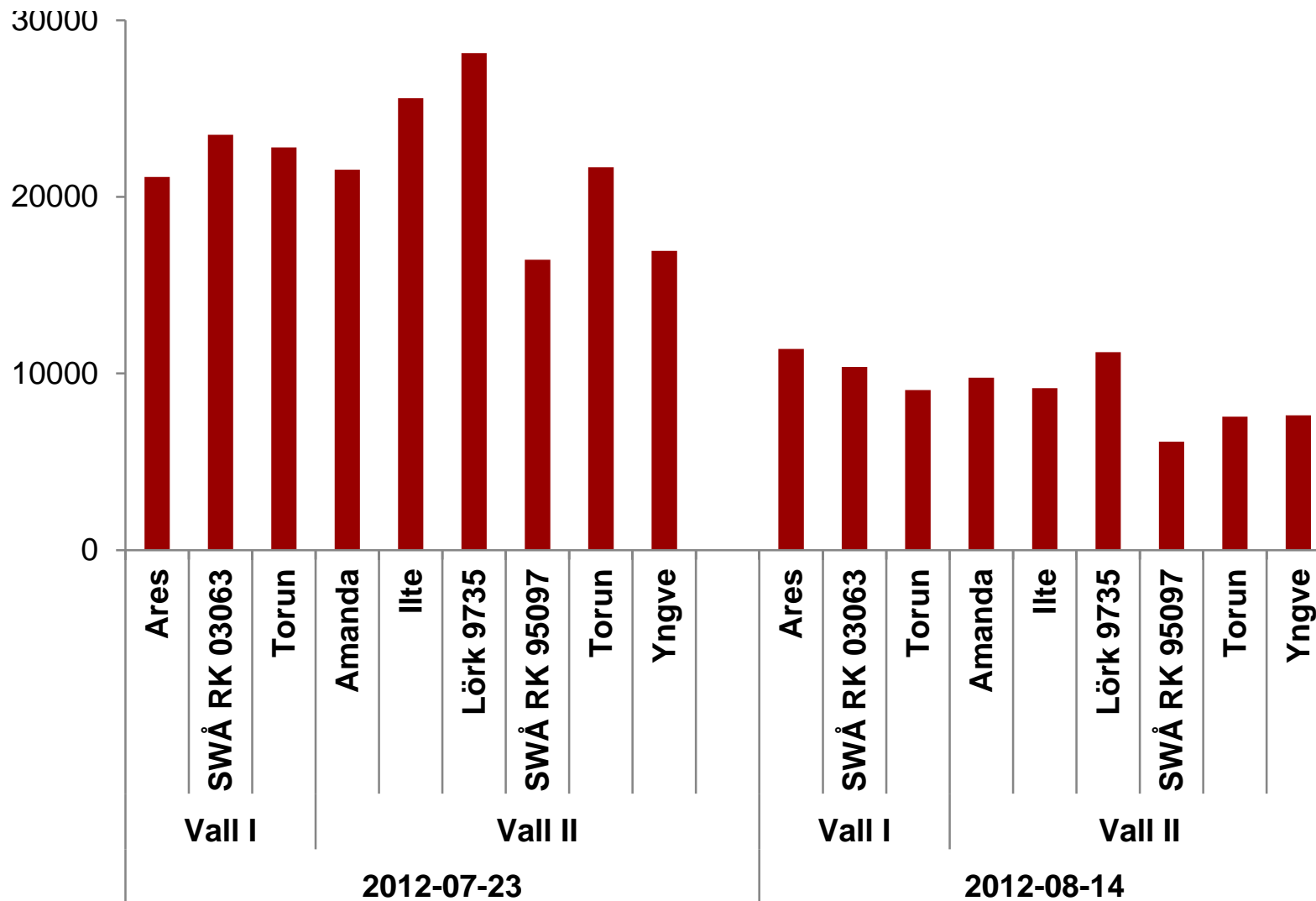
- Variety testing
- Ley I and ley II
- Harvested two times, 5 and 8 weeks after first harvest



□ 1+3 □ 4 ■ 5 ▨ 6a ■ 6b ▩ 7 ▩ 8

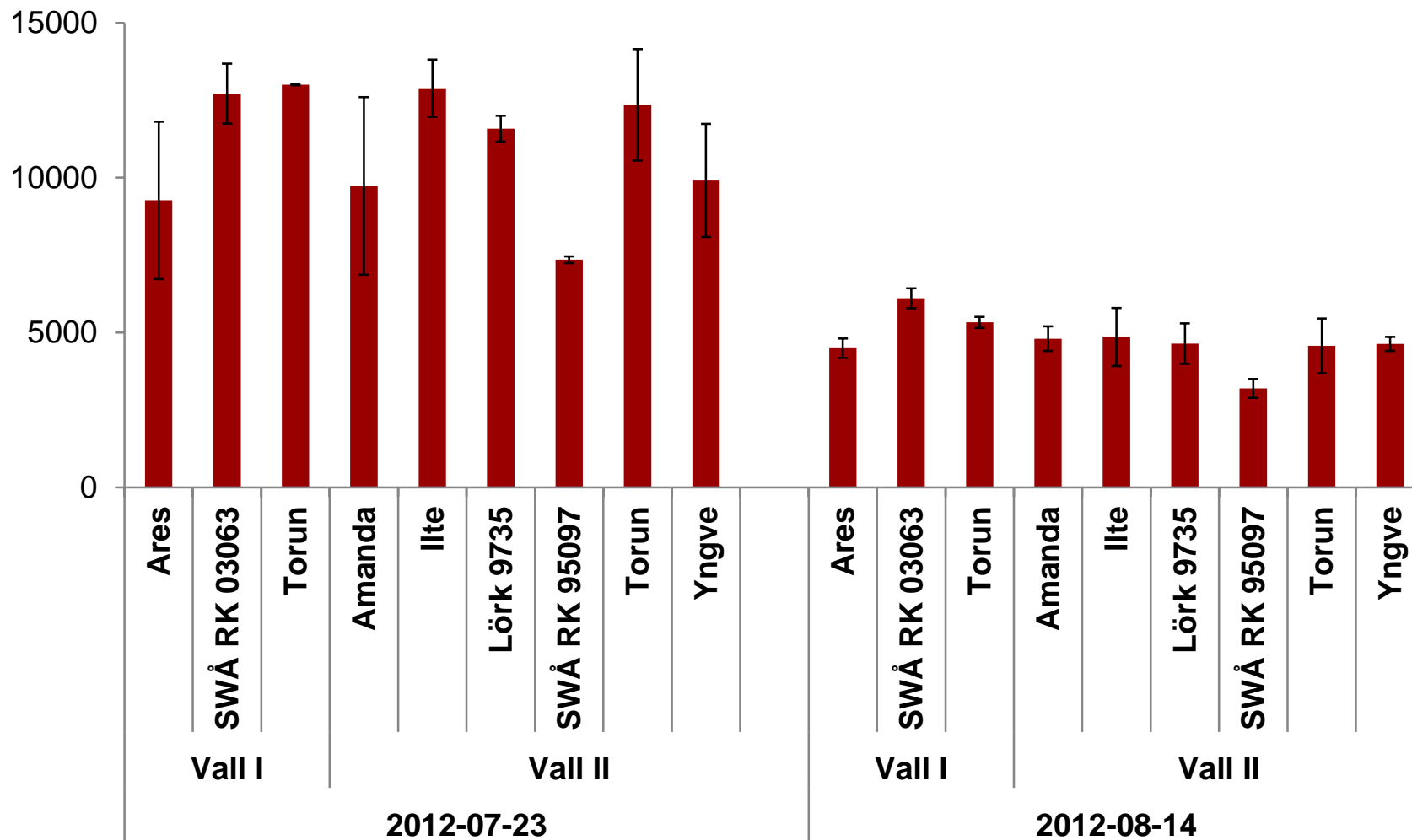


## Total phytoestrogen concentration





## Formononetin concentration





- Mainly differences between harvests
- Early and late varieties
- Expensive analysis
- Time consuming
- This summer



# In bovine milk

- “Milk study”
  - High concentrations of equol when feeding red clover
  
- Conventional milk from 5 dairies and organic milk from 5 dairies
  - 1.5 % fat (mellanmjölk)
  - Same week
  
- More equol in organic milk
  - Lower than in experiments
  
- Little difference between regions



# Conclusions/questions

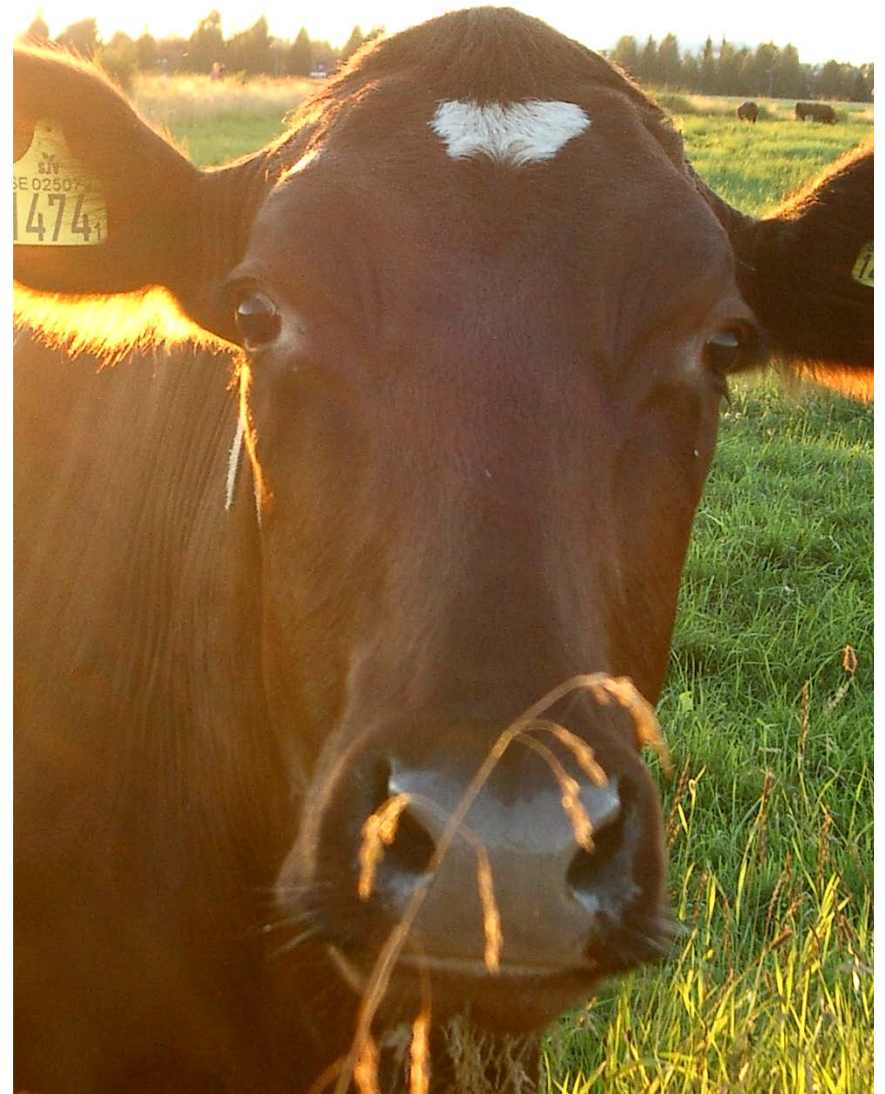
- Are the differences between varieties big enough?
  - Practical use for farmers?
  
- Low concentration in milk for human consumption
  - Although higher in organic than conventional
  
- Physical effects on cattle and sheep
  - Organic production?
  - Calves?



## Thanks to

- Research council Formas
- RJN – Regional jordbruksforskning i norra Sverige
- KSLA – Kungliga skogs- och lantbruksakademien

And thanks to you!





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