

# Old pea cultivars with high protein content

## Genotyping, phenotyping and field evaluation

Søren K. Rasmussen, Conny B. A. Lange, Lasse S. Jespersen, Gert Poulsen  
 Molecular Plant Breeding, University of Copenhagen, Frederiksberg, Denmark  
 Email: skr@plen.ku.dk

### High protein pea

High protein crops are currently the focus of many projects, discussions and goals especially in the farming sector but also for human diets based vegetables. *Pisum sativum* is such a high protein crop with high nutritional value for feed and fodder. Propagation and characterization of old pea cultivars for modern Danish agriculture. From NordGen 300+ accessions were selected based on the protein content and disease resistance. Pure lines were obtained by single seed descent (SSD) in the greenhouse and DNA were isolated and genotyped by DArTseq markers. The pure lines were field propagated the following years.



### *Pisum sativum* - Pea

- Pea is an old crop adapted to the farming conditions in Denmark and old pea cultivars has potential in modern plant breeding
- Pea has been cultivated as long as Wheat (~7000 y bc)
- In Denmark Pea is probably cultivated from the Medieval (500-1500 ac) and onwards
- In 1600 we see the first sweet and soft cultivars for consuming right away
- Cultivars from the Nordic seedbank, NordGen are probably up to 100 years old, but we don't know for sure yet

### Breeding goals over time

- Upright plants
- Shorter plants (field)/longer plants (gardens)
- More flowers and pods (seeds)
- More tendrils and fewer leaflets
- Protein content

### Additional morphological variation

- Flower colour
- Flowering time
- Ripeness (time and coordination)
- Root system (mostly along the surface)

### Field propagation and evaluation in 2017

Single rows (2 m) were used for propagation of 230 accessions

### Field propagation and evaluation in 2018

Single rows (10 m) were used for propagation of 100 accessions with above 25-% protein.

Year	Row/plot	Sowing	10% flower	90% flower	Harvest	Yield	Protein-%	TGW
2017	2 m	17 May	2/6-3/7	21/6-5/7	23/8, 5/9	0-500 g	11-32	n.a.
2018	10 m	4 & 7 May	2/6-27/6	18/6-9/7		0.5-2 kg	11-33	100 – 200+
2019	15 m <sup>2</sup>	2 May						

### Yield trial 2019 (55°40' N and 12°18' E, Taastrup, Denmark)

Plots (15 m<sup>2</sup>) of 30 accessions with highest protein-% in 2018 and 2017

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