

Differences among hybrid aspen clones in ability to produce root mass and regenerate from root cuttings

Niina Stenvall
Finnish Forest Research Institute



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Why are we interested in hybrid aspen?

- Short fibers
 - Suitable fiber form
 - Low lignin content
 - White-coloured wood
 - High growth rate
- ⇒ **Suitable raw material for high quality paper production**



Hybrid aspen has high genetic variation

- Only some clones attain the high standards of paper industry
- Variation can be minimized by using clonal material

⇒ Vegetative propagation

- Micropropagation
- Stem cuttings
- Root cuttings



Stock plants



Stock plant containers



Root system



Cutting technique



Root cuttings on growth medium



Shoot initiation in root cutting



Clone	Number of donor plants	Number of root cuttings	Mean number of root cuttings per donor plant	Number of produced plants	Sprouting percent
1	12	2626	219	1422	54
2	11	1649	150	855	52
3	11	1258	114	721	57
4	12	2325	194	1065	46
5	12	2084	174	705	34
6	12	1628	136	470	29
7	11	1449	132	490	34
8	12	2220	185	1265	57
Mean			163		45



Clonal differences in sprouting



Demands for stock plants in root cutting technique

- Effective sprouting
- High root mass production
- Easy washing off soil
- Suitable structure of root system



Study of root mass production

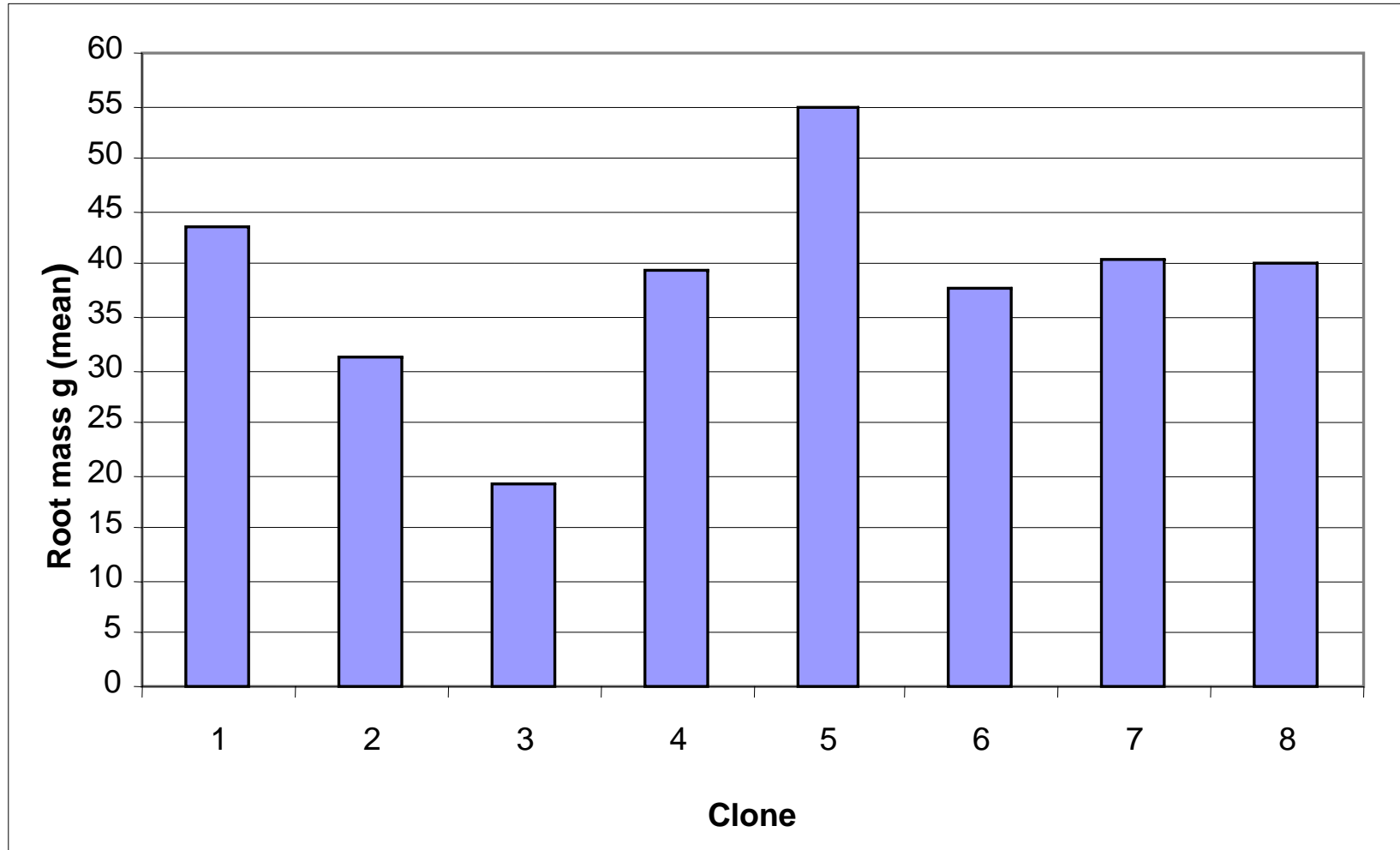
- **Growth mediums:**
 - Sand
 - Sand + peat 2:1
 - Sand + peat 1:1
 - Sand + peat 1:2
 - Peat
- **Low and normal irrigation treatment**



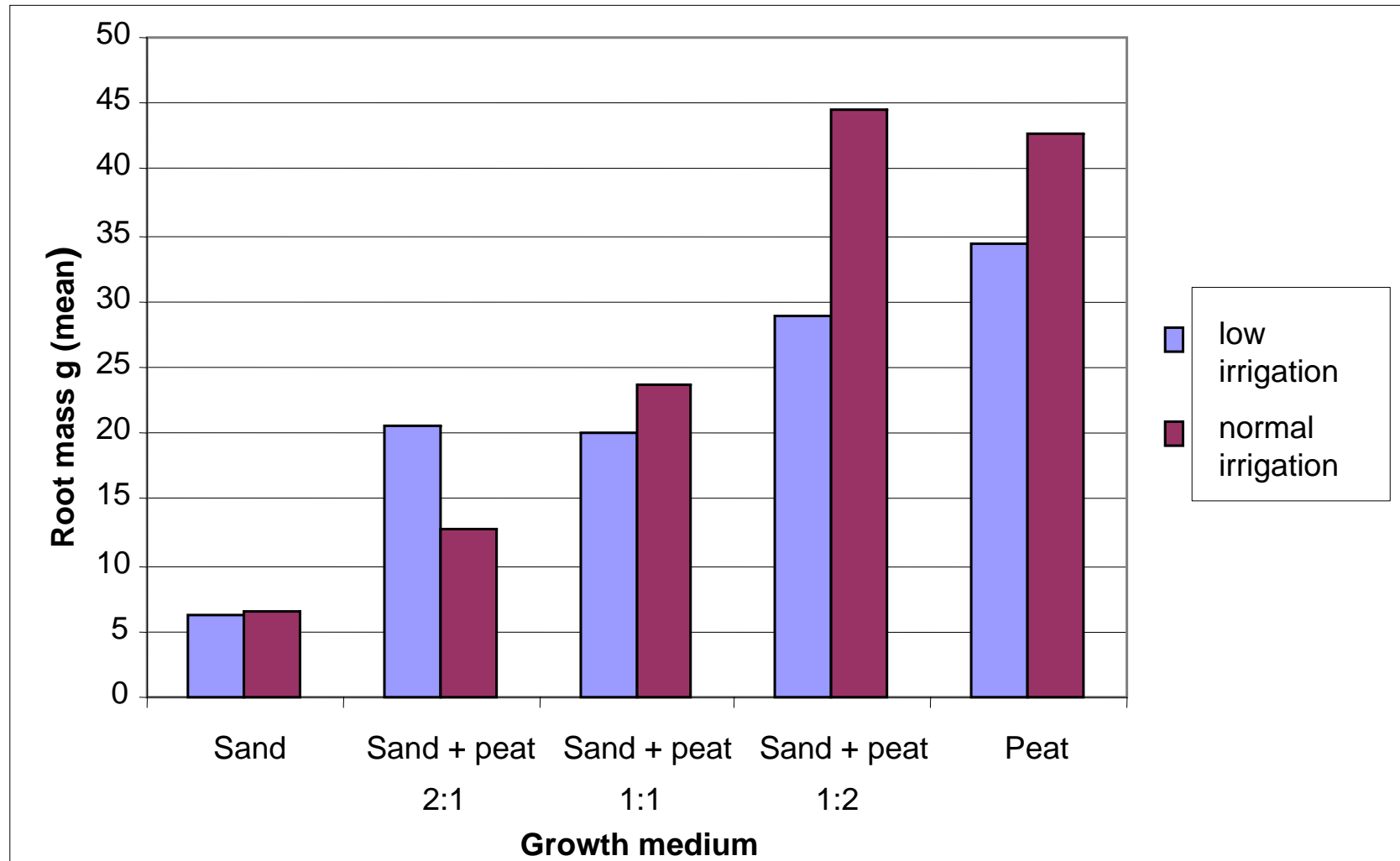
Stock plants in sand medium



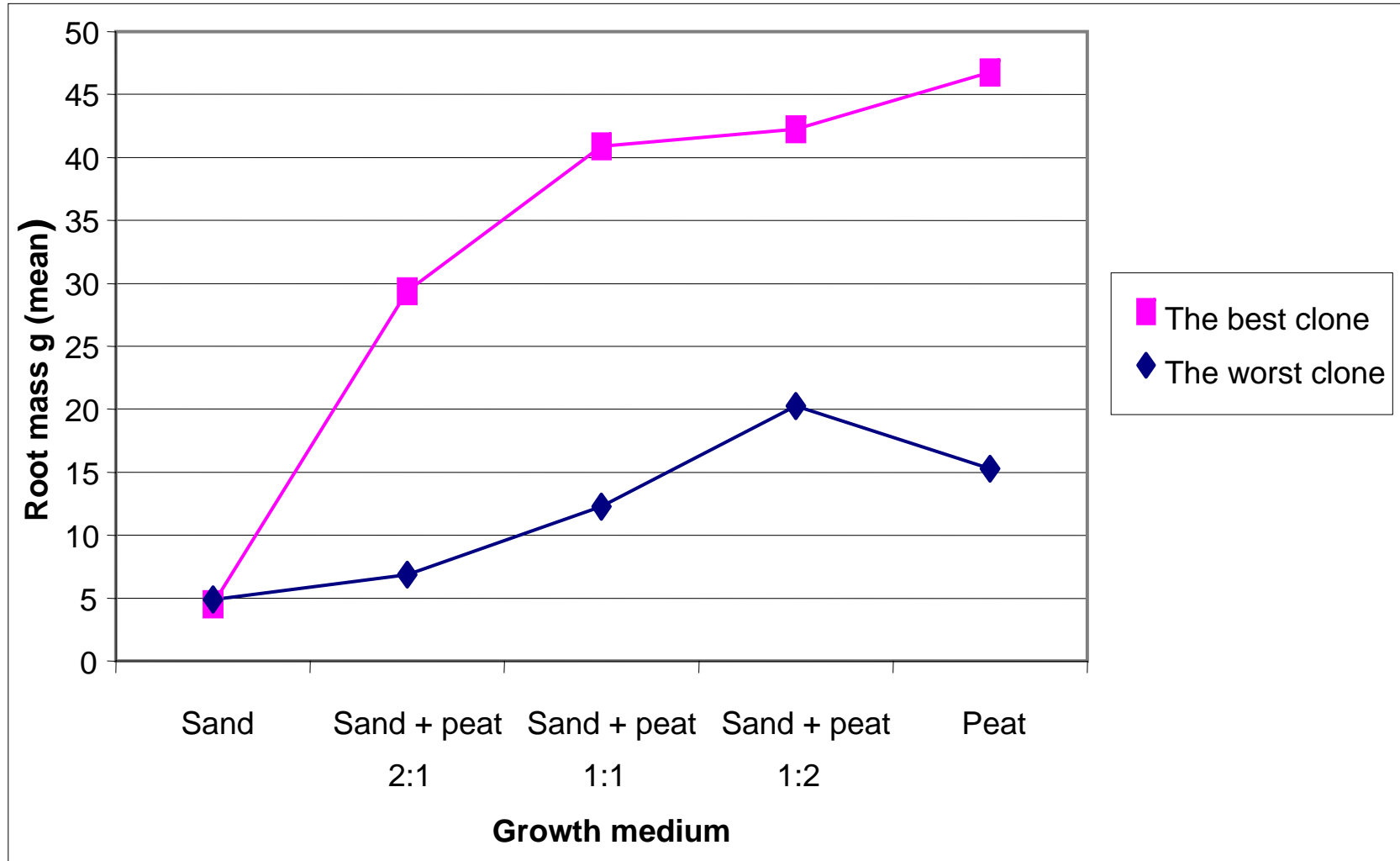
Root mass production of clones



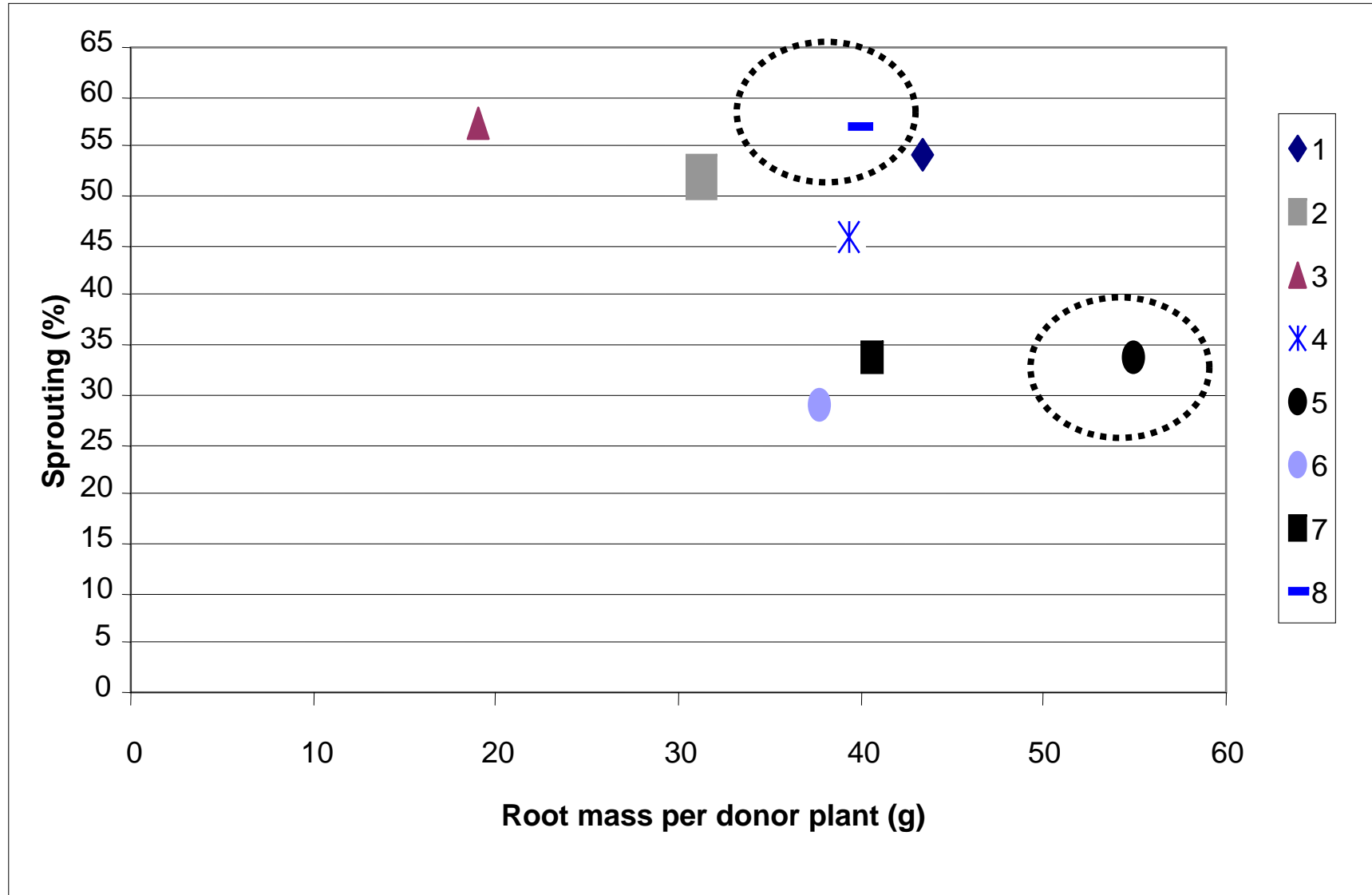
The effect of environment on root mass production



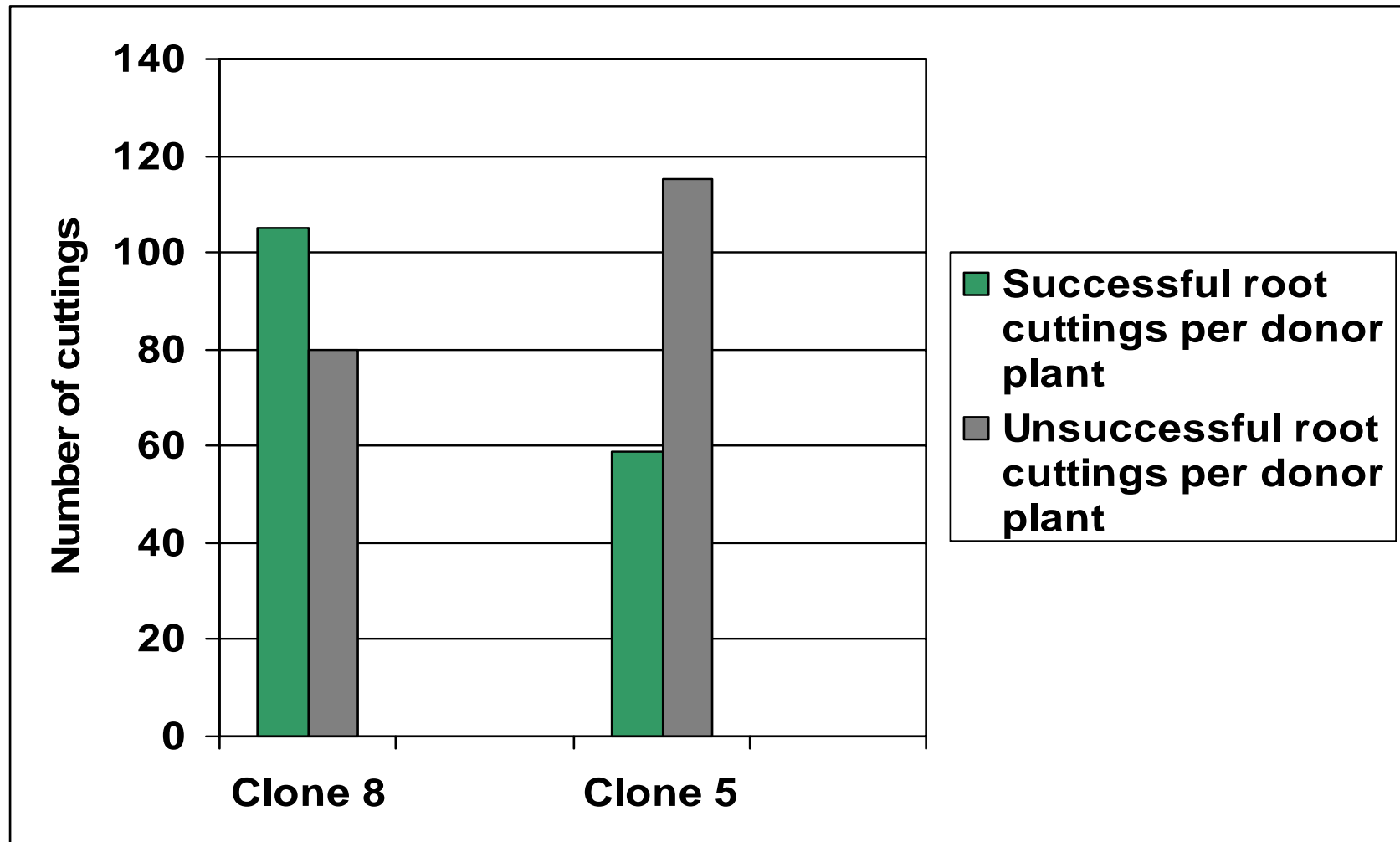
Behavior of two clones in the experiment



Root mass production versus sprouting



Effects of clonal selection



Future research

- Stability of clones
 - Do the clones behave similarly year after year?
 - Regeneration of plant from root piece
 - Location of initiation of root and shoot?
 - Can initiation process be affected?
- ⇒ focus of research in to laboratory work and more controlled environment



Our research group

- Pertti Pulkkinen (Project Leader)
- Niina Stenvall (Research Scientist)
- Tapani Haapala (Research Scientist)
- Säde Aarlahti (Student of Horticulture)
- Hanna Alanen (Student of Silviculture)
- Sanna Laitinen (Student of Silviculture)
- Jouni Nieminen (Forestry Technician)

THANK YOU!

