



Föryngringsutmaningar

i anslutning till kanter och
kvarlämnade träd

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Wallenberg Initiatives in Forest Research

Vi undersöker hur klimat, miljö och genetik påverkar hur skogen växer och mår. Genom grundforskning skapar Wallenberg Initiatives in Forest Research (WIFORCE) kunskap för att sköta skogen hållbart i ett förändrat klimat.

Wallenberg Initiatives in Forest Research

Wallenberg Initiatives in Forest Research (WIFORCE) inkluderar två forskningsprogram – ett inom framtidens skogsskötsel och ett inom skogsbioteknik – samt en forskarskola där över 50 doktorander kommer att utbildas.

Till programmet är också fem rekryteringspaket knutna, en till varje delprojekt:

- Skogsskötsel och biologisk mångfald i terrestra miljöer
- Skogsskötsel och biologisk mångfald i vattenrika miljöer
- Verktyg för strukturell och funktionell biologisk mångfaldsutvärdering
- Kartläggning av biologisk mångfald med hjälp av eDNA
- Genetisk biodiversitet i relation till skogsskötsel

Forskningsprogrammet Framtidens skogsskötsel

Forskningsprogrammet kopplar samman grundforskning om träd, mark och landskap med tillämpad forskning inom skogsskötsel. Målet är att utveckla skogsskötselmetoder för framtiden. Programmet är placerat vid SLU:s institution för skogens ekologi och skötsel i Umeå.

Programchef: Sandra Jämtgård

FORSKNINGSPROJEKT

Skogsföryngring längs hyggeskanter och i luckor



FORSKNINGSPROJEKT

Föryngring i flerskiktad skog ur ett ekofysiologiskt perspektiv



FORSKNINGSPROJEKT

Effekten av olika kväveformer på växtrötter

NYCKELPUNKTER

- ✓ Rotanatomi
- ✓ kväveupptag
- ✓ kväveformer



Examensarbeten (jägmästarprogrammet)

Marcus Björs (2024)

Julian Säflund (2025)

Doktorander (Inst. Skogens ekologi och skötsel)

Alexina Brännlund (2023 – pågående)

Ellen Svensson (2024 – pågående)

Marcus Björs (2025 – pågående)

Postdoc (Inst. Skogens ekologi och skötsel)

Jasmin Danzberger (2023-2025)

ON THE SPACE ARRANGEMENT OF TREES AND ROOT COMPETITION

By V. T. AALTONEN

Forest Research Institute, Helsinki, Finland

A determined space arrangement obtains between the trees of a forest. Its inherent nature and manifestations become apparent most easily through a few examples.

A normally dense dry heath Scotch pine stand generally has no seedlings. A few seedlings, of course, may exist here and there, but even they are in a more or less sickly condition. But if a clearing of a few acres or more is cut into the stand, before long seedlings will appear in it which will slowly develop larger and larger. The seedlings will not thrive very close to the mother trees, but require a sufficiently large opening. A definite space arrangement exists between the seed trees and the seedlings.

It is also worth while to study more closely the appearance of the seedlings in such an opening of, say about 20 years of age. It will be peculiar in that respect, that the seedlings in the center of the opening are the highest, and become relatively shorter as we approach the edge of the mother stand. The height of the seedlings, compared to the height of the mother trees, and the distance of the seedlings from the mother

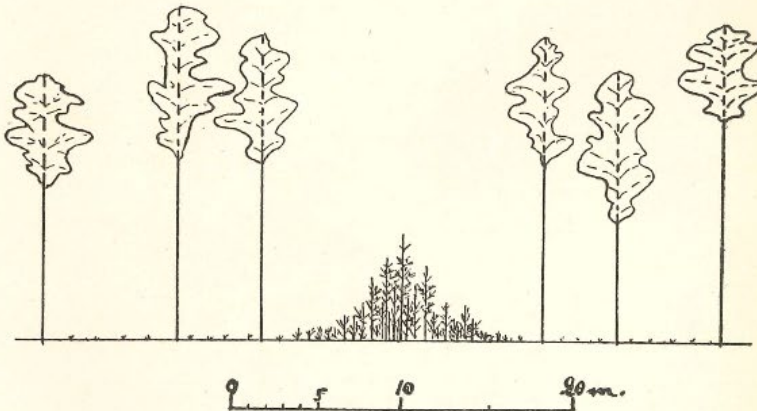


Illustration 1
An Opening in a Dry Heath Pine Stand.

Historisk forskning på ämnet V.T. Aaltonen (1926)

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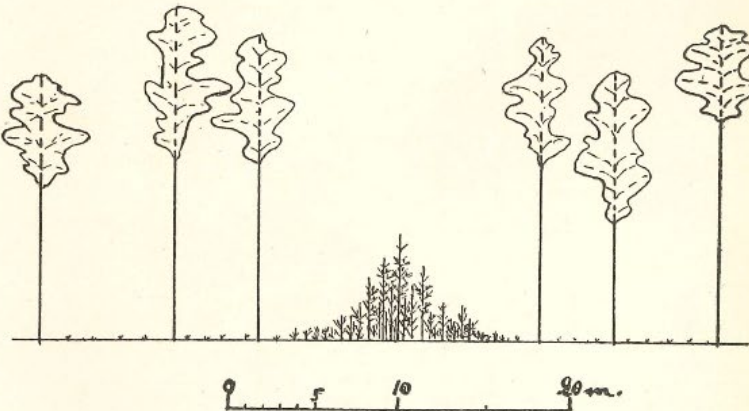


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An Opening in a Dry Heath Pine Stand.

Historisk forskning på ämnet V.T. Aaltonen (1926)

Observerade
svag föryngring
inom 5-6 meter
from hyggeskant
eller frötall.

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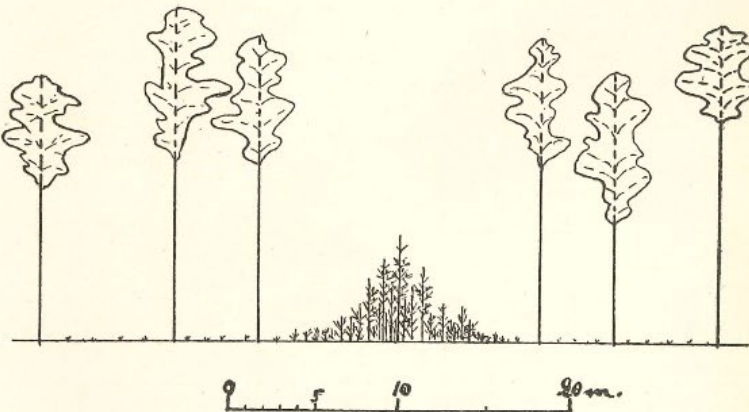


Illustration 1
An Opening in a Dry Heath Pine Stand.

Historisk forskning på ämnet

V.T. Aaltonen (1926)

Fenomenet var tydligast på de skarpaste ståndorterna.

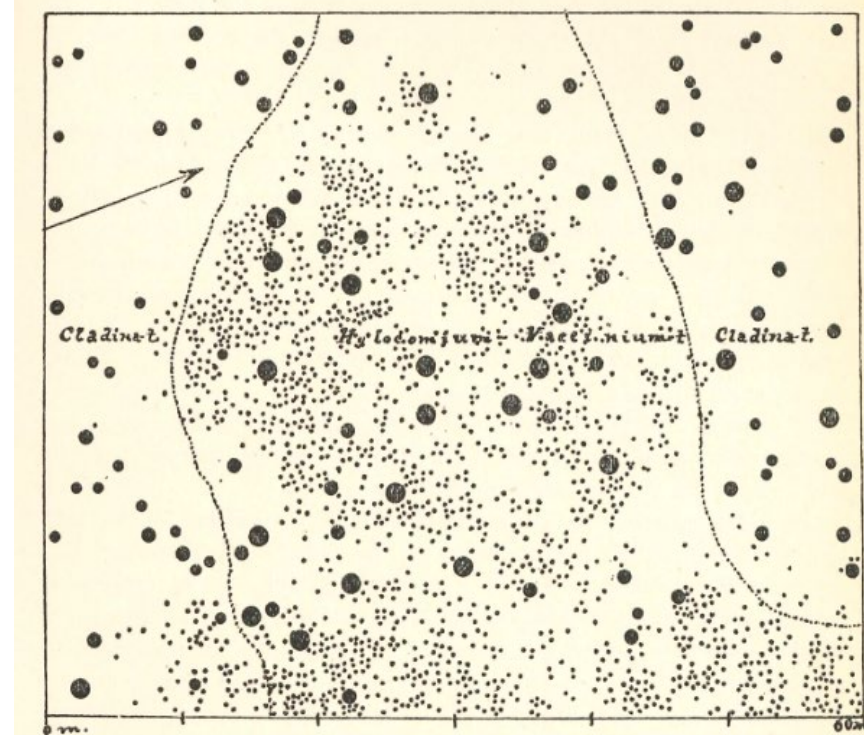


Illustration 4

The effects of forest type on the space arrangement between mother trees and seedlings. The central part Vaccinium type, the edges Cladina type. The diameter-classes of the trunks are: 12-20, 22-30, 32+ cm. at breast height; the little dots represent younger age-classes.

Observerade svag föryngring inom 5-6 meter from hyggeskant eller frötall.



Så här skulle
Aaltonens
tallhed ha
kunnat se ut

Ofta är denna zon ca
5-6 meter bred.

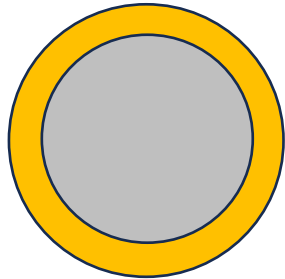
Foto: Andreas Palmén



Foto: Andreas Palmén

Kantzonsens betydelse i luckhuggning

Liten lucka (1ha)



32 % kant

Större avverkad
yta lucka (4ha)



17 % kant

10 ha avverkad yta

11 % kant



Historisk forskning på ämnet

E. Björkman (1944) *Studier över ljusets betydelse på tallhedar*

506

ERIK BJÖRKMAN

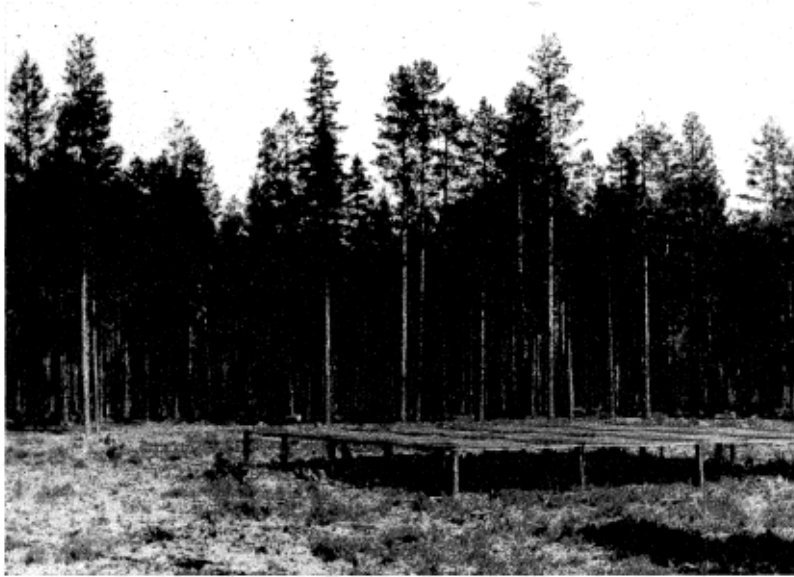


Fig. 4. »Beskuggningstake» mitt på 5-årigt hygge på tallhed, kronoparken Åheden, Västerbotten. Under »taket» är belysningen nedsatt till samma styrka som i det omgivande beståndet, nämligen c:a 40 % av dagsljuset i det fria. Foto aug. 1944.
»Screening roof» in the middle of a 5-year clearing on a pine-heath, Crown Forest of Åheden, Västerbotten. Under the »roof» the light is reduced to the same strength as in the surrounding stand, viz. 40 % of the daylight in the open. Photo Aug. 1944.

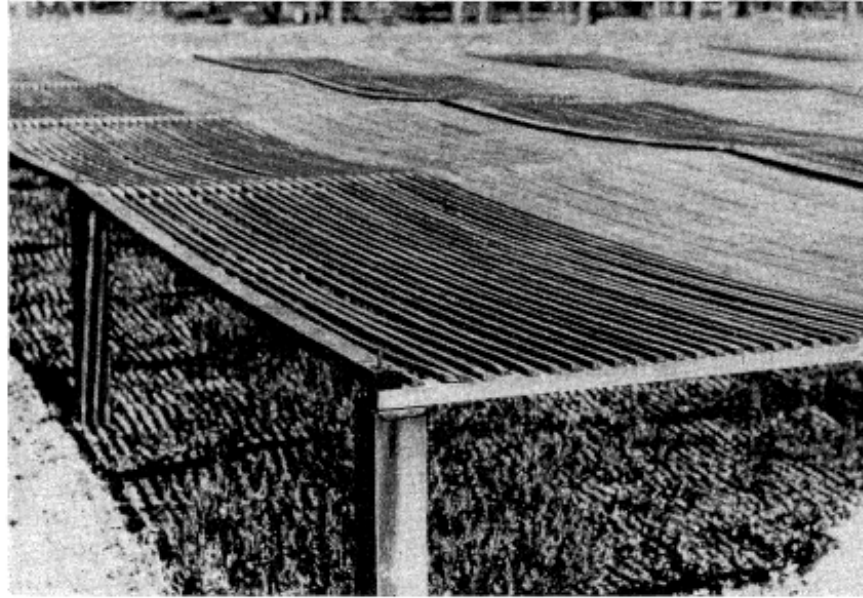
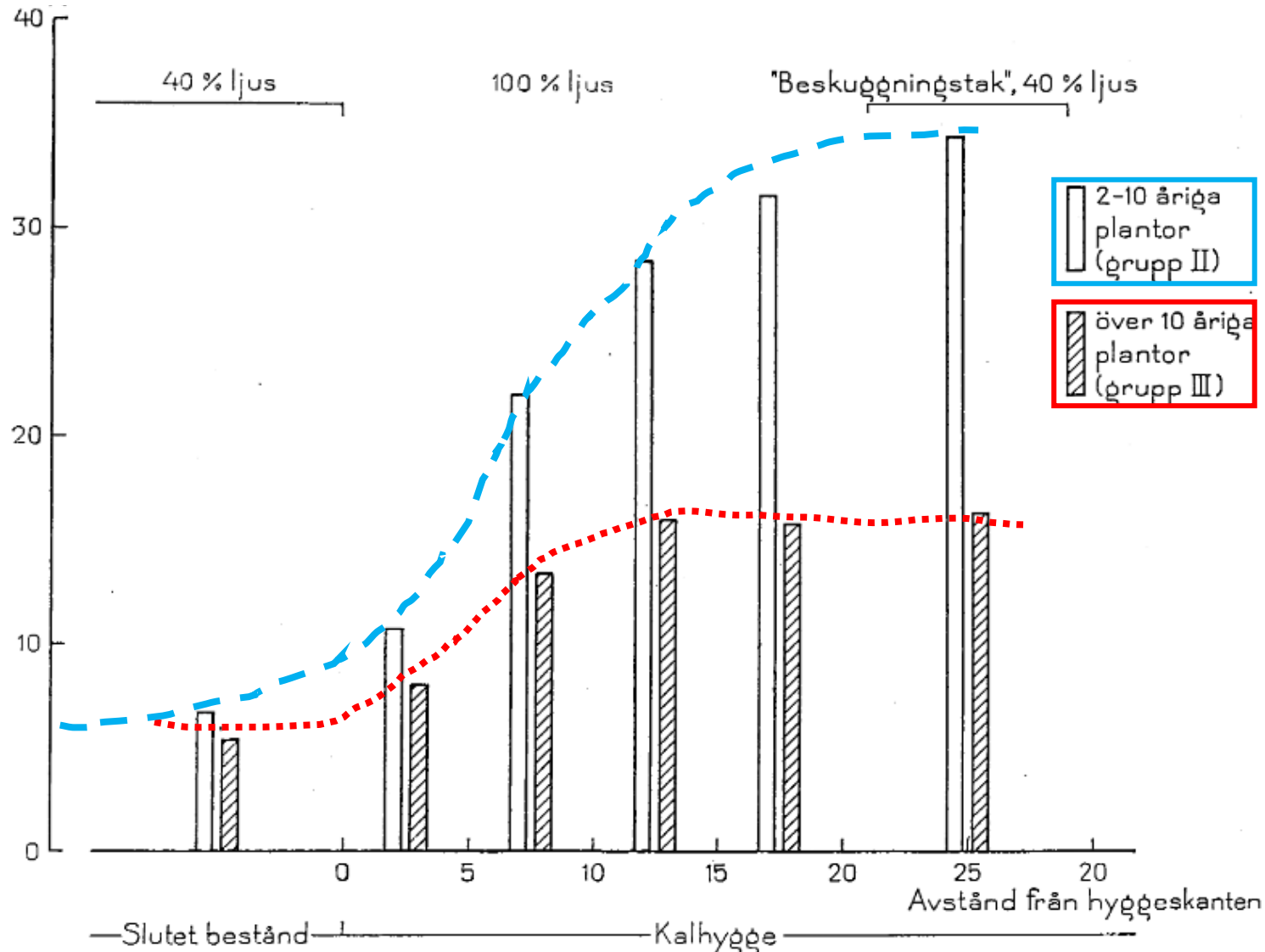


Fig. 5. Detaljbild av »beskuggningstaket» i fig. 4. Foto aug. 1944.
Detail of the »screening roof» in Fig. 4. Photo Aug. 1944.

Toppskottets längd (% av plantans höjd)



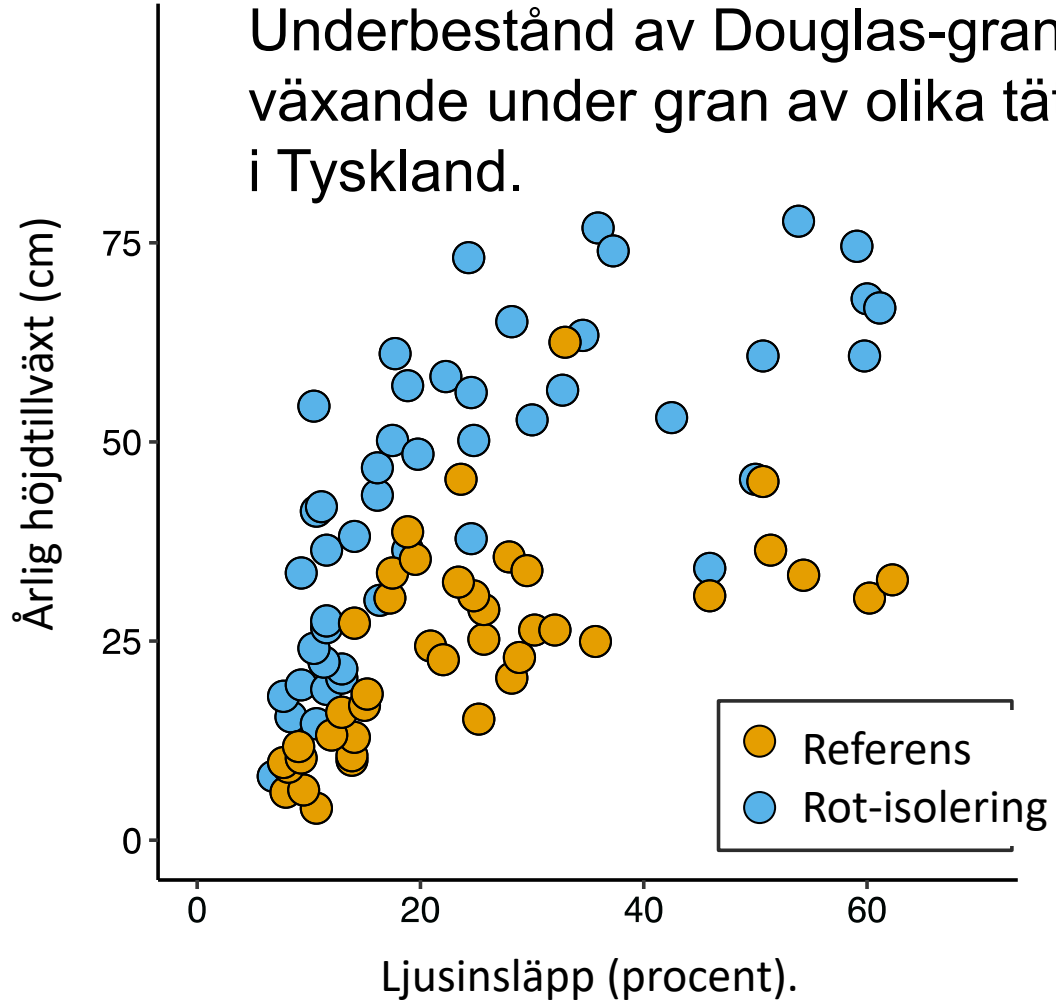
Toppskottets längd i procent av plantans höjd i medeltal hos tallplantor av de år 1944 urskilda åldersgrupperna II och III på 5-årigt hygge på olika avstånd (m) från hyggeskanten och under »beskuggningstak» mitt på hygget samt i omgivande slutna bestånd, kronoparken Åheden, aug. 1944.

Average length of the top shoot as percentage of the total height in pine plants of age groups II and III, as recorded in 1944, growing on a 5-year-old clearing at varying distances (m.) from its edge and under a »screening roof» in the middle of the clearing, as well as in surrounding closed stands. The Crown Forest of Åheden, Aug. 1944.

Höjdtillväxt = height-growth. Slutet bestånd = closed stand. Kalhygge = open clearing. Avstånd från hyggeskanten = distance from the edge of the clearing. »Beskuggningstak», 40 % ljus = »screening roof», 40 % light.

Rotisoleringsstudier i modern tid

Underbestånd av Douglas-gran,
växande under gran av olika täthet,
i Tyskland.



(Figuren omritad ifrån Petritan et al (2011))

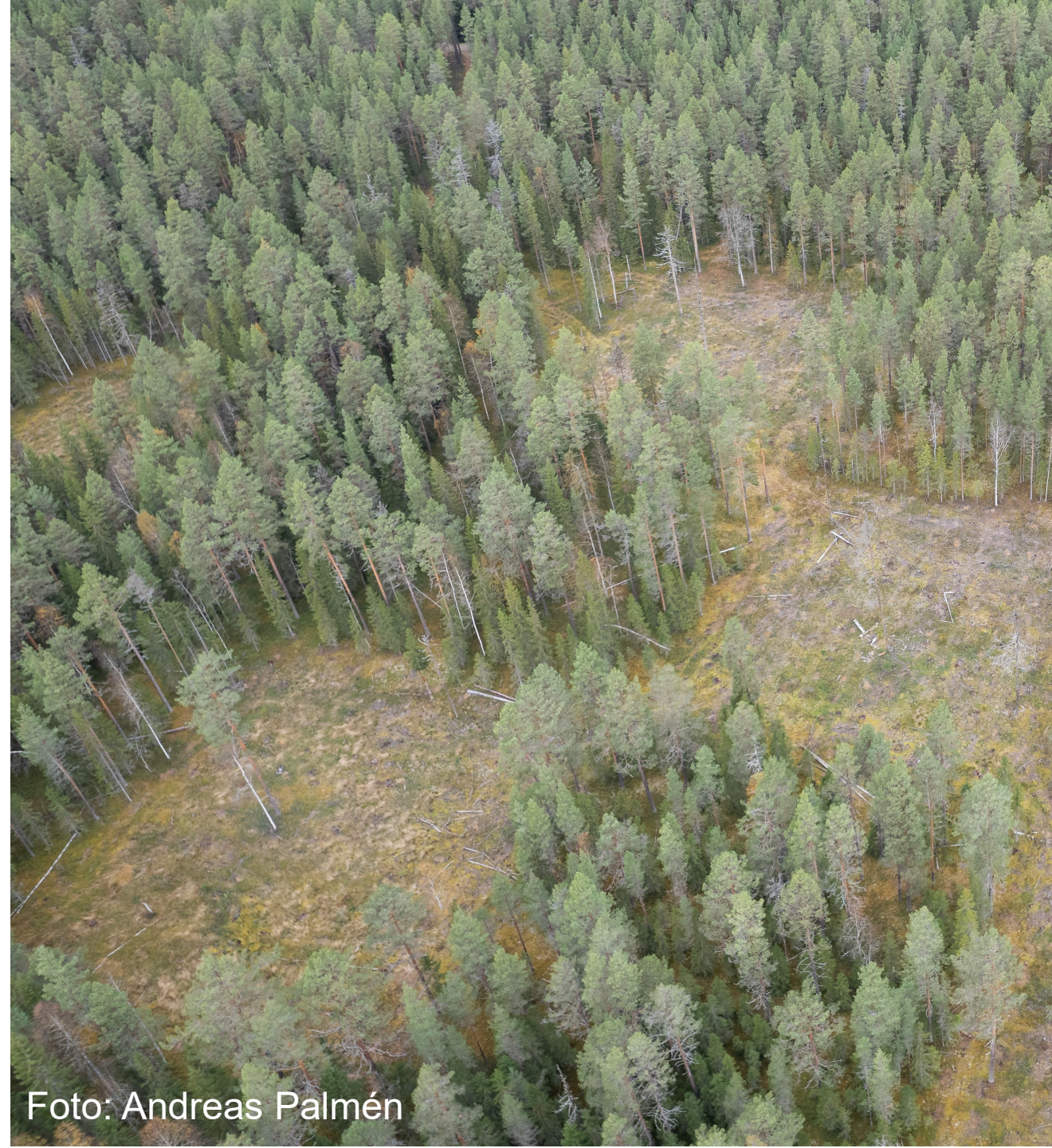
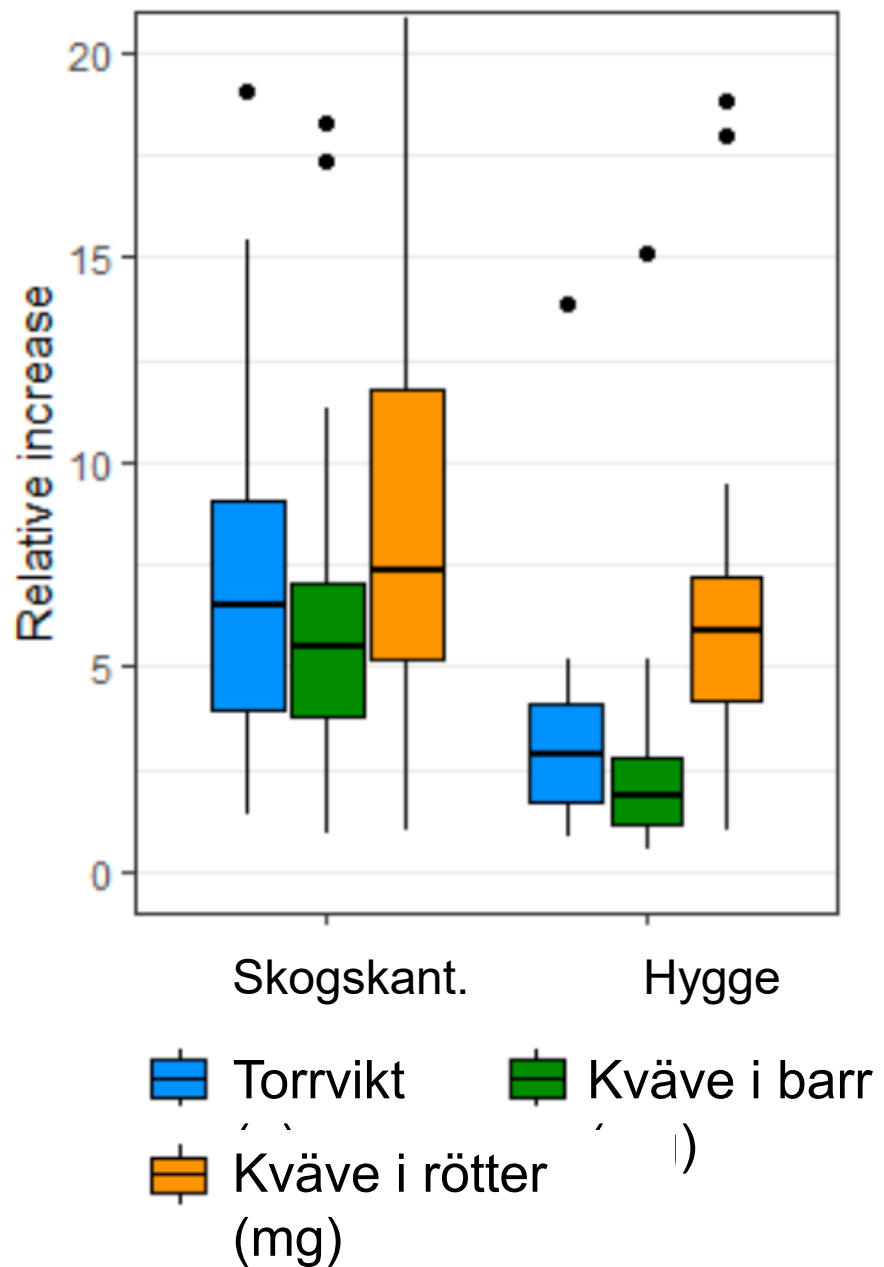


Foto: Andreas Palmén



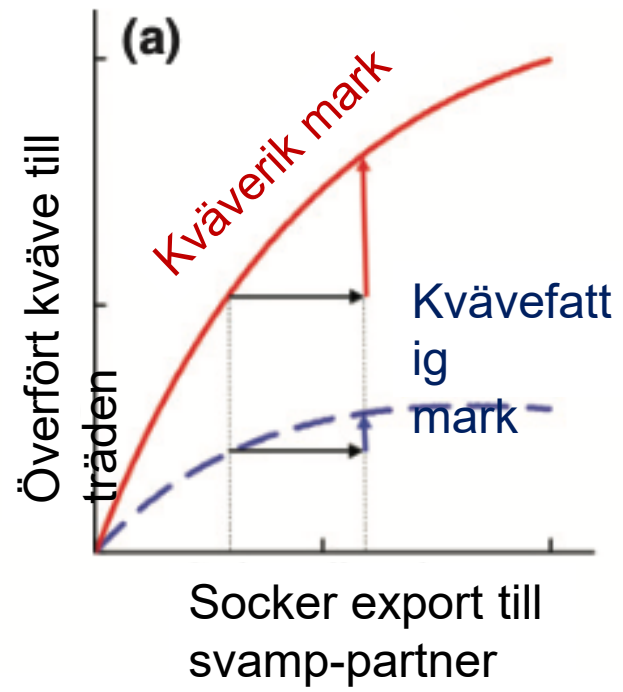
Befrielse från markkonkurrens intill skogskant och på hygge.

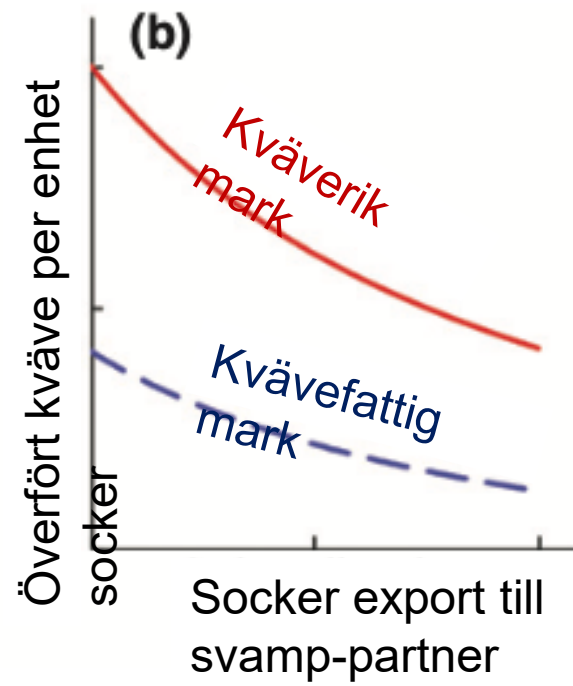
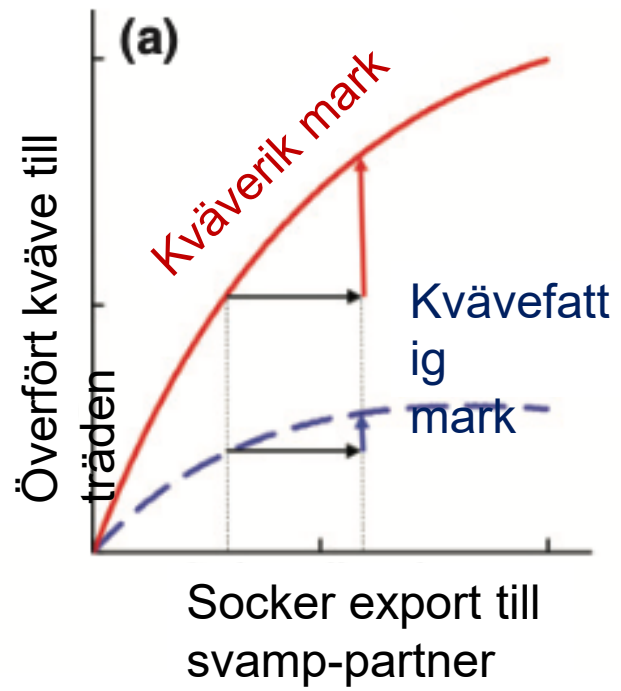
Data ifrån experiment på en tallhed i Västerbotten.

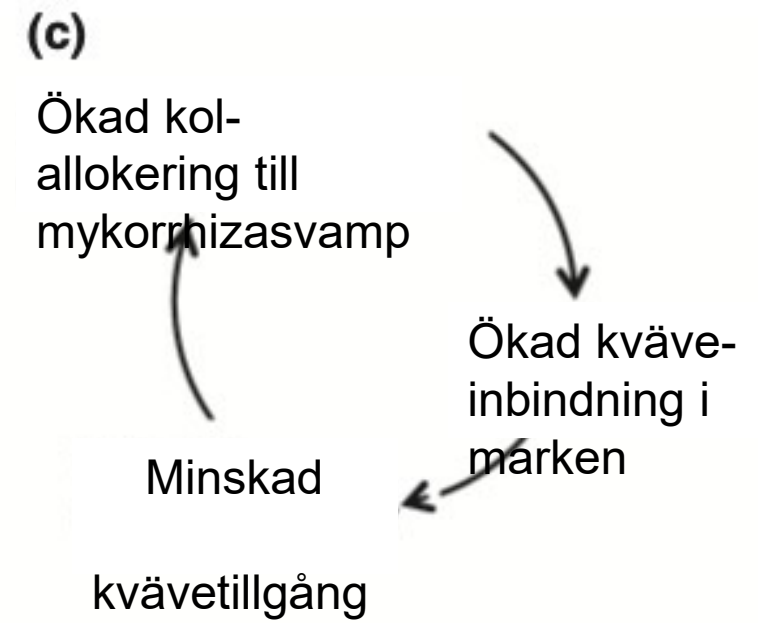
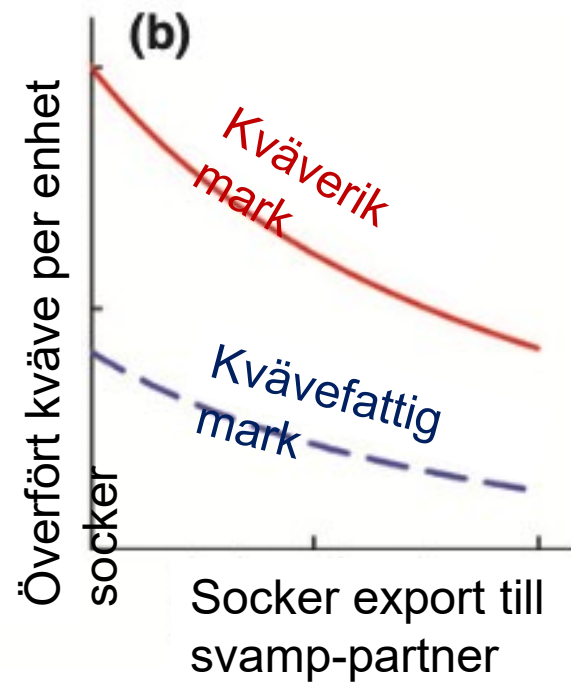
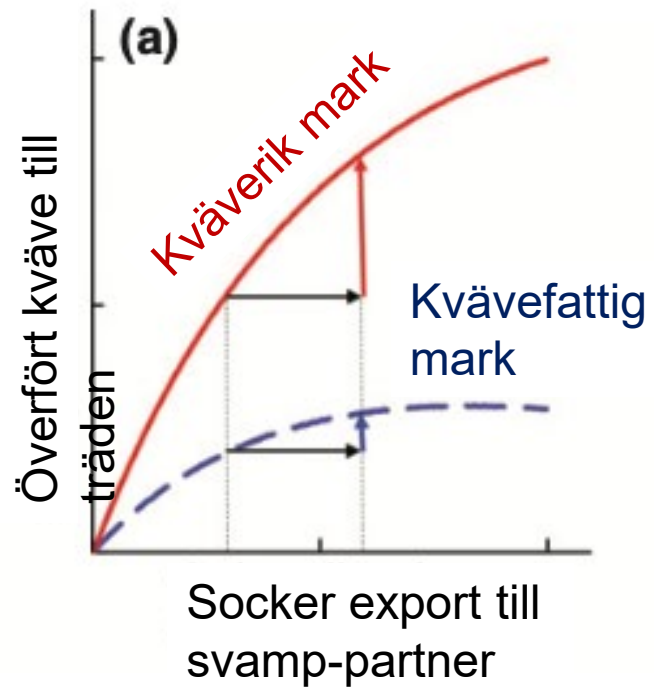


En närmare titt på näringskonkurrens i nordliga skogsmarker









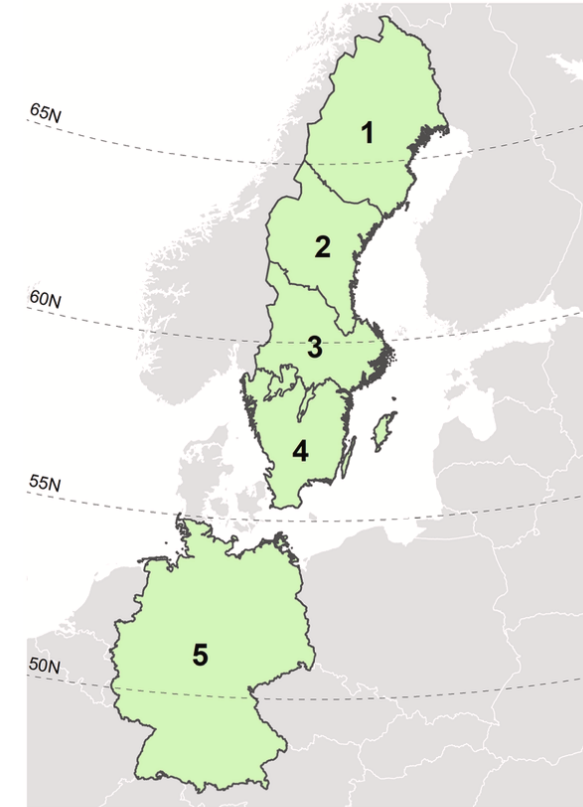


Fig. 2. The gradient from 69 °N to 47 °N; 1, N. Norrland; 2, S. Norrland; 3, Svealand; 4, Götaland (1–4 are parts of Sweden) and 5, Germany. The two larger islands in the Baltic Sea (Gotland and Öland) belong to region Götaland.

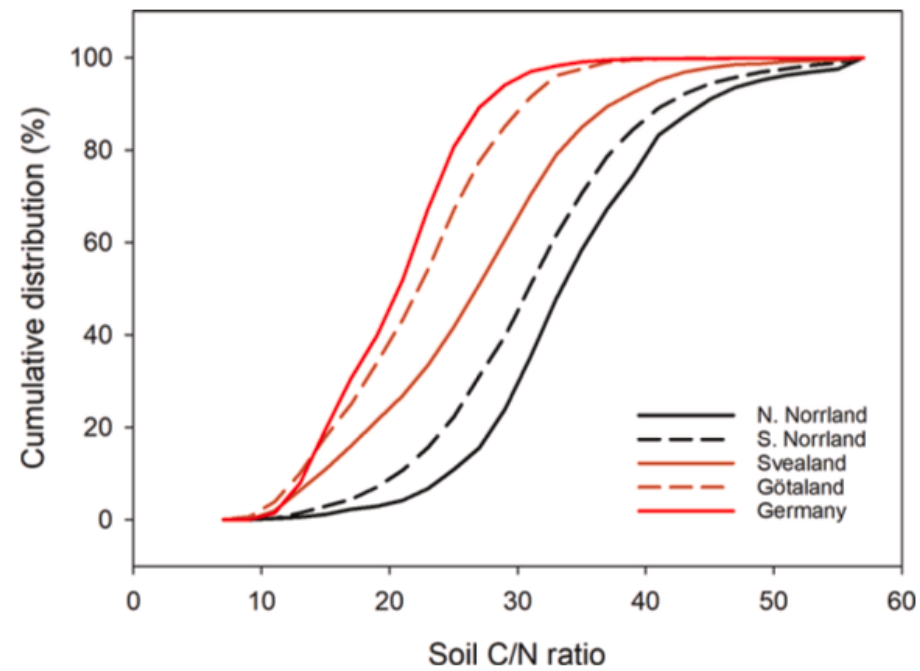


Fig. 4. Cumulative distribution of C/N ratios in forest soils among regions of Sweden and in Germany.

Table 2

Summary of data on forest area and soil C/N ratio by region in Sweden and in Germany. Mha = million hectares. Means $\pm$ 1.0 S.E.

Country or region	Area of forests (Mha)	No. of observations	C/N	Percent of soils with C/N > 25
N. Norrland	9.7	1364	35.3 $\pm$ 0.2	91.4
S. Norrland	6.9	1401	32.2 $\pm$ 0.2	81.4
Svealand	6.0	1740	27.7 $\pm$ 0.2	62.4
Götaland	5.4	2087	23.0 $\pm$ 0.1	39.4
Germany	10.3	1788	21.5 $\pm$ 0.1	26.3

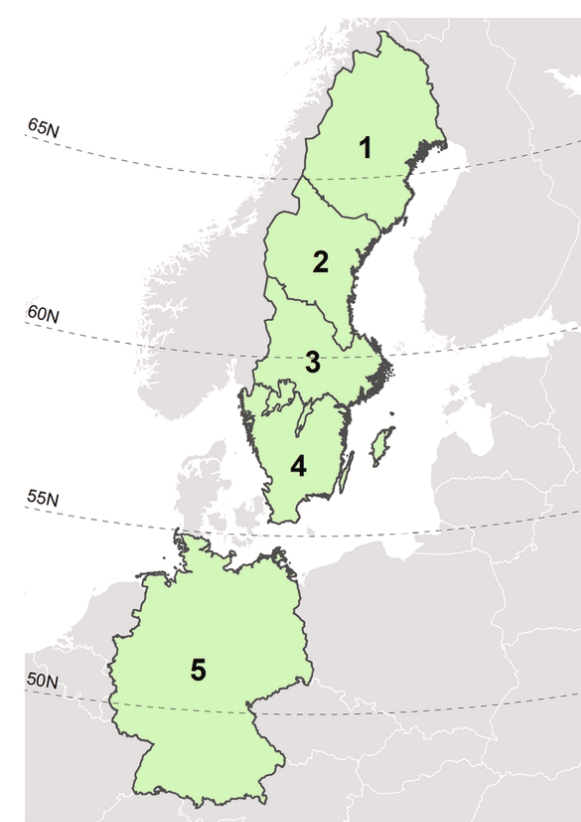


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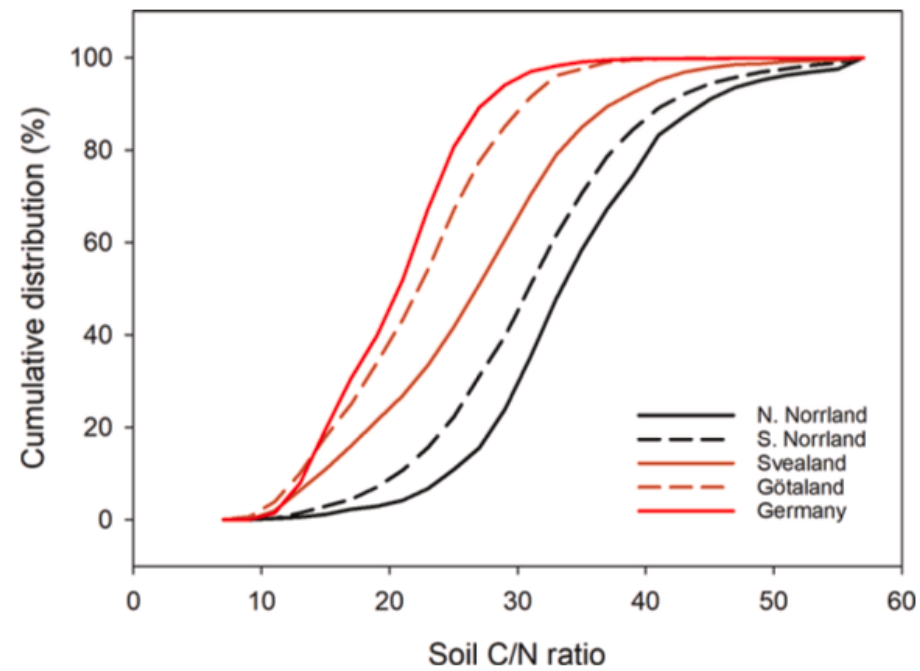


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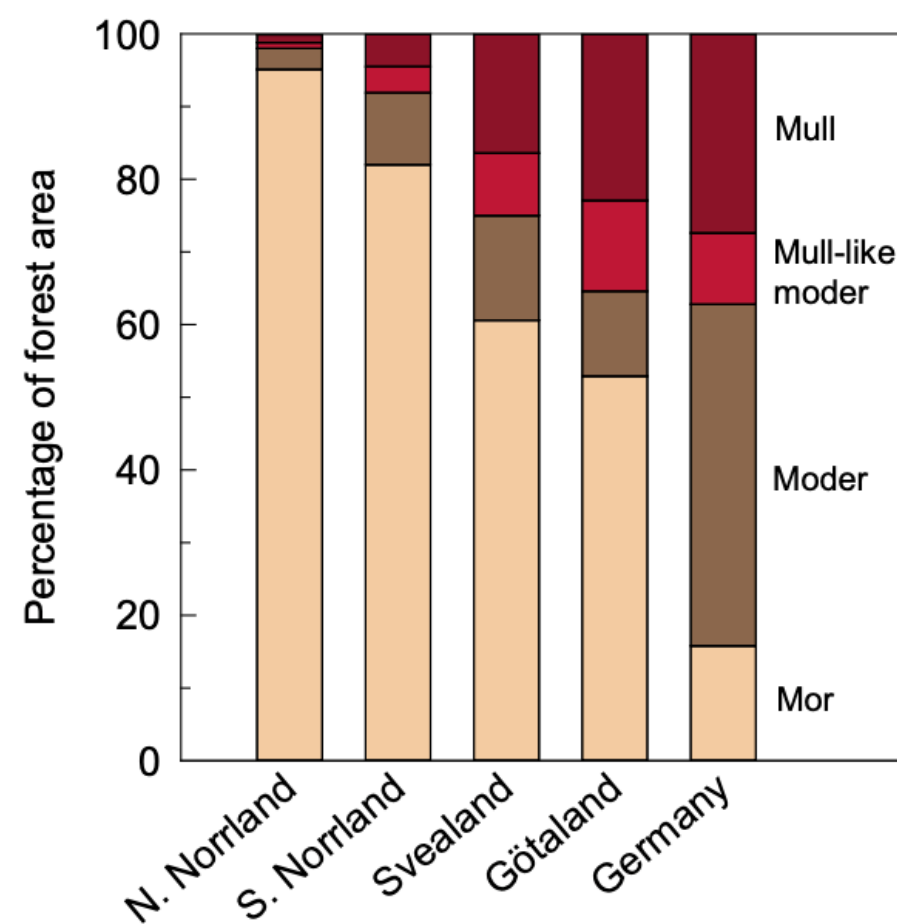


Fig. 5. Distribution of humus forms in forest soils along the gradient from northern Norrland, through southern Norrland, Svealand, Götaland to Germany. The humus forms are described in Table 1 and in the Appendix.

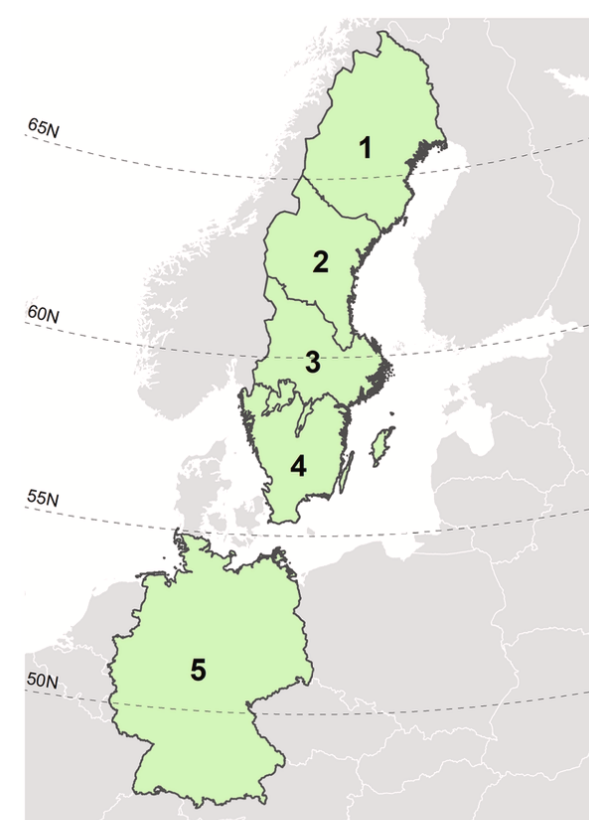


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