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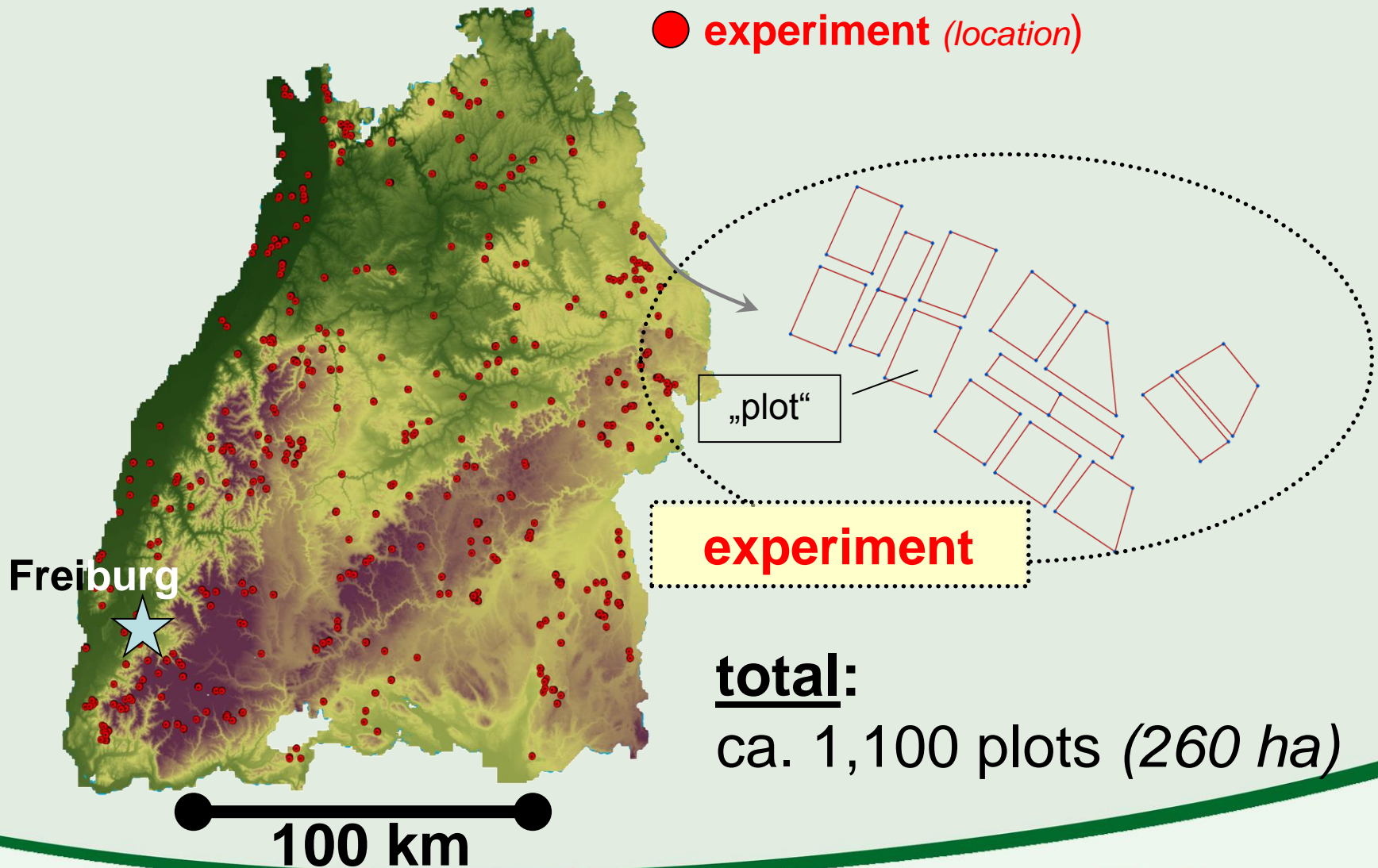
# *long-term forest growth research in Baden-Württemberg*

**Forest Research Institute Baden-Württemberg**  
*- dept. forest growth -*



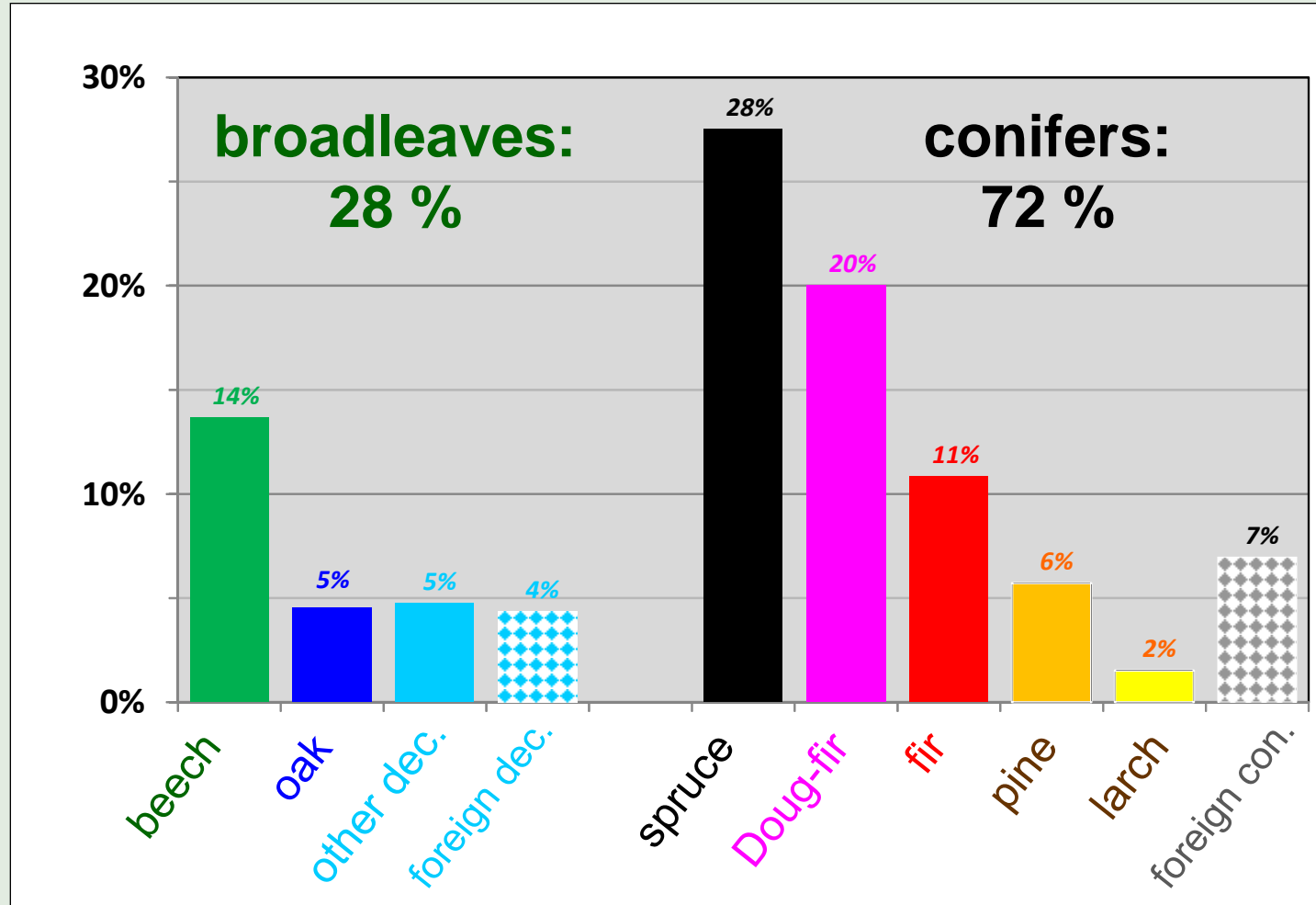
Forstliche Versuchs-  
und Forschungsanstalt  
Baden-Württemberg

# experiment network



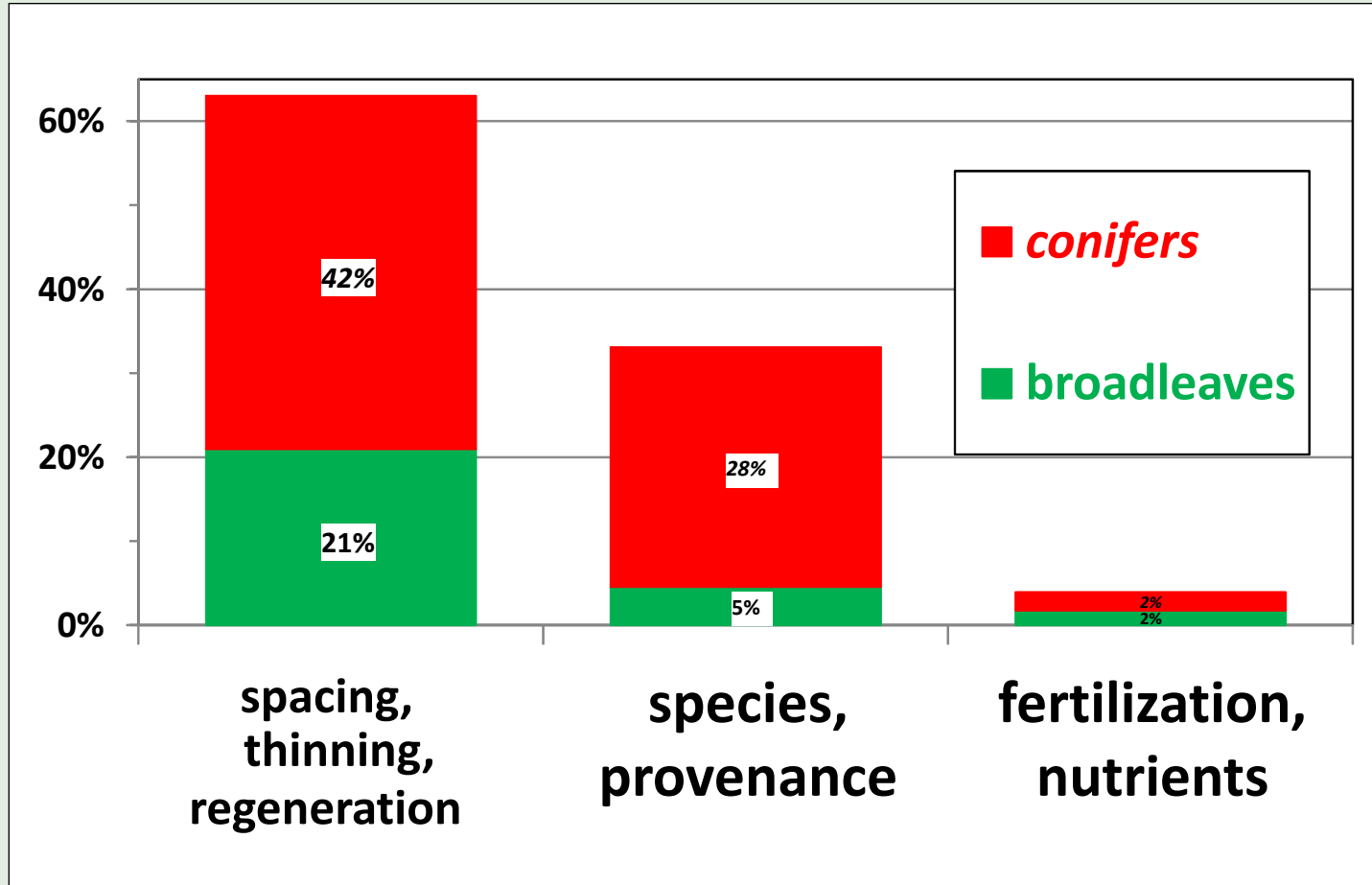
# species

(1.100 plots, 260 ha)



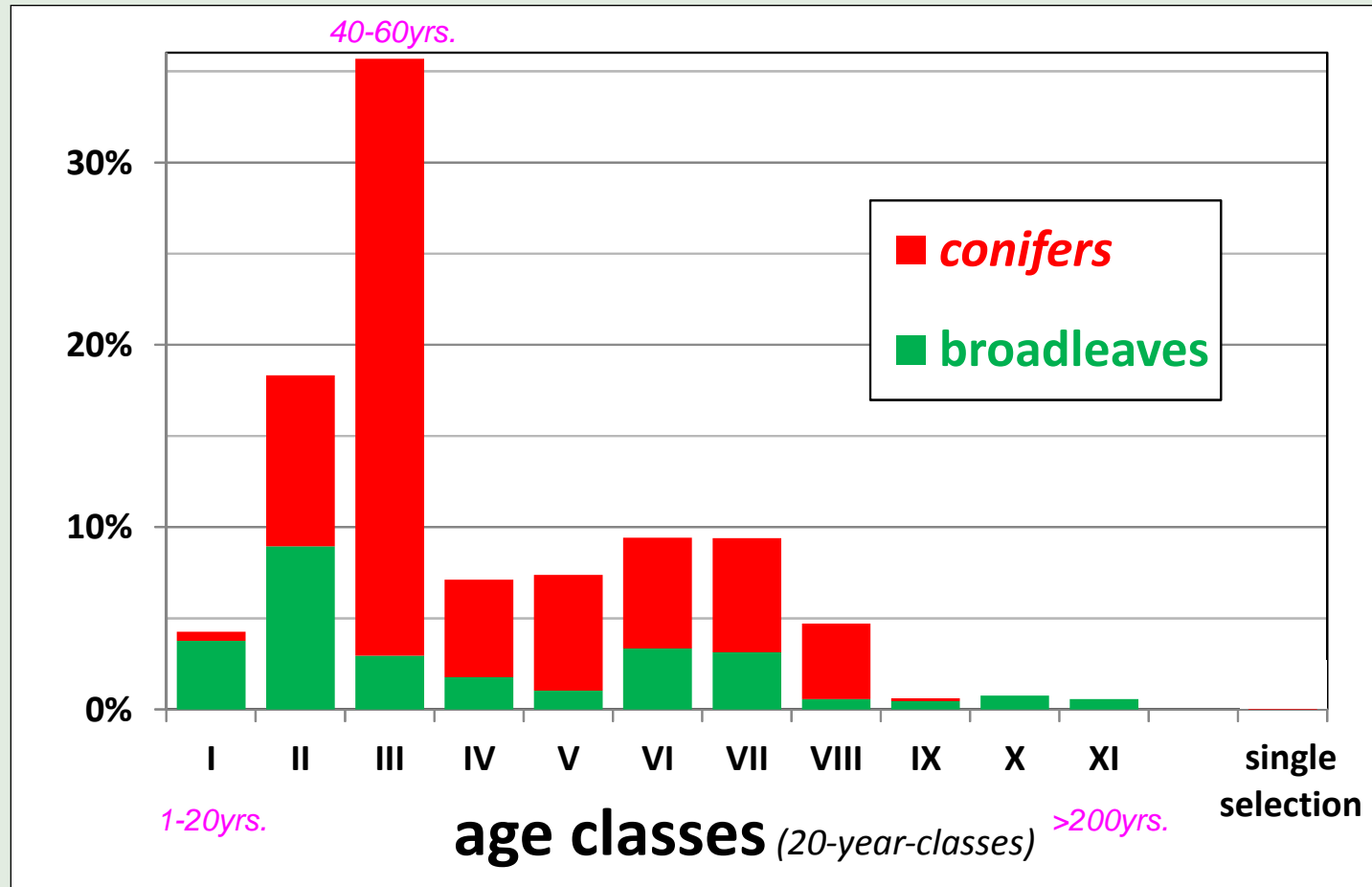
# objectives (categories)

(1.100 plots, 260 ha)

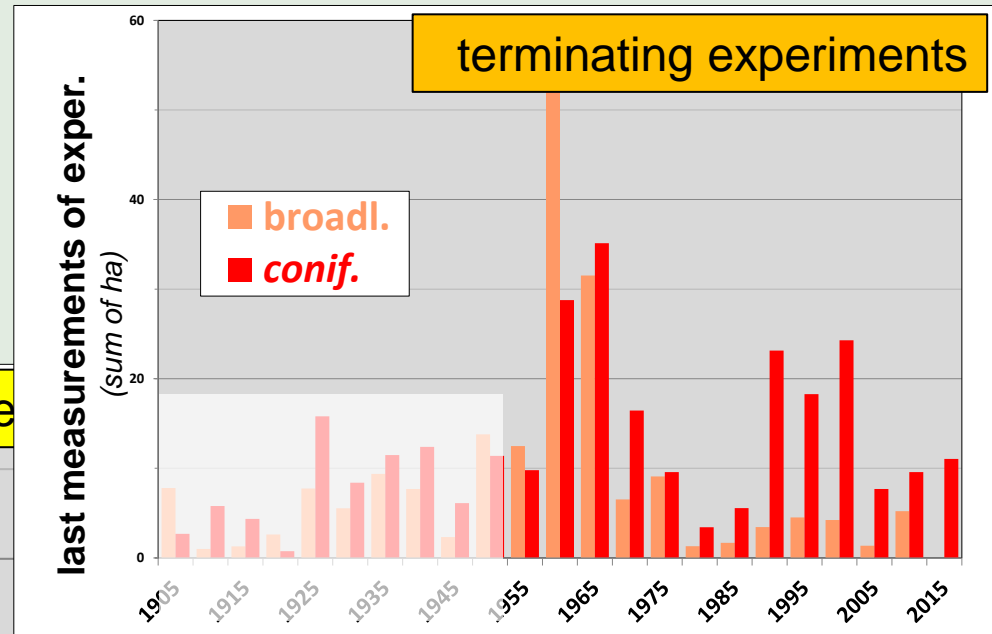
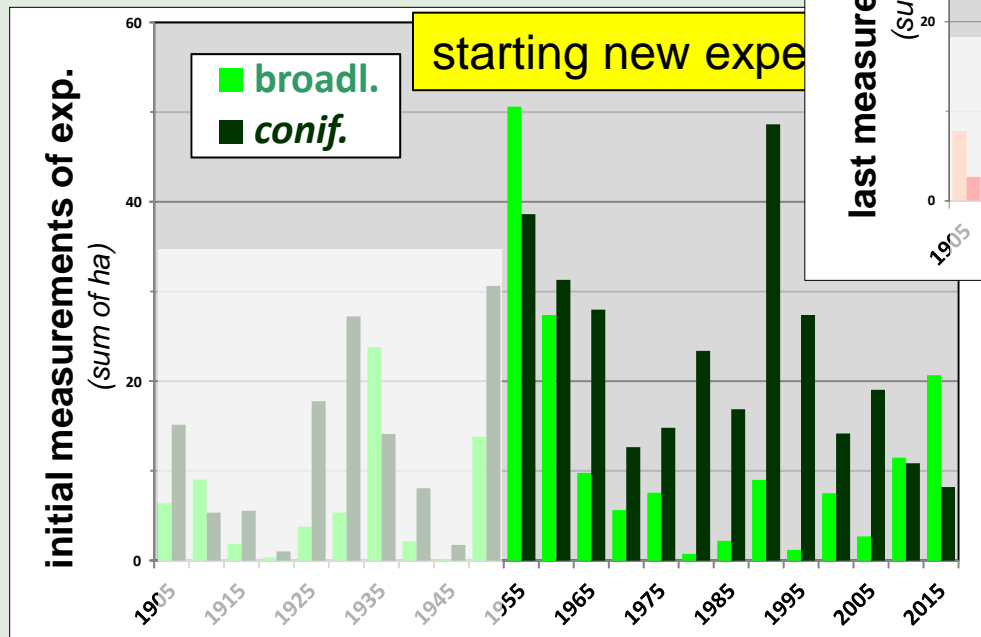


# age structure

(1.100 plots, 260 ha)



# change in composition



# principles

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- quantify treatments
- contrasting treatments
- experiment series
- digital database

# principles: *treatment quantification*

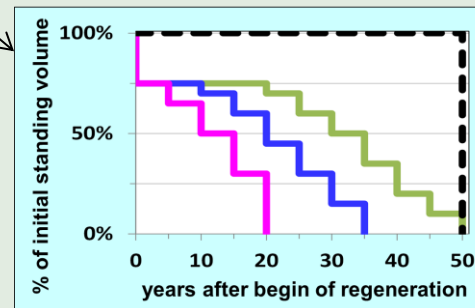
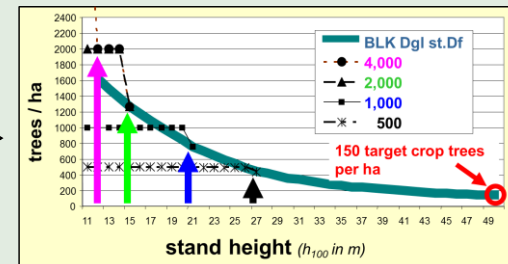
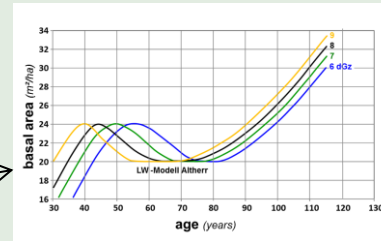
- reduce subjective judgement („noise“)
- quantification > *feasibility in practical forestry*
- examples:

✓ number & spacing of trees to plant  
(*plantation experiments in Norway spruce*)

✓ target basal area  
(*high thinning in beech*)

✓ target density  
(*crop-tree thinning in Douglas-fir*)

✓ pre-defined volume reduction  
(*group-shelterwood regeneration in fir*)





# principles: *contrasting treatments*

- enhance differences between result
- show principal influences/effects  
*not just some nuances*
- provide data for robust effect models / growth models  
*include extreme treatments beyond practical applications*

**pre-commercial thinning**  
(Norway spruce)

>100 thsd spruce /ha

**untreated**

250 spots /ha

**spot release**  
(radius: 2m)

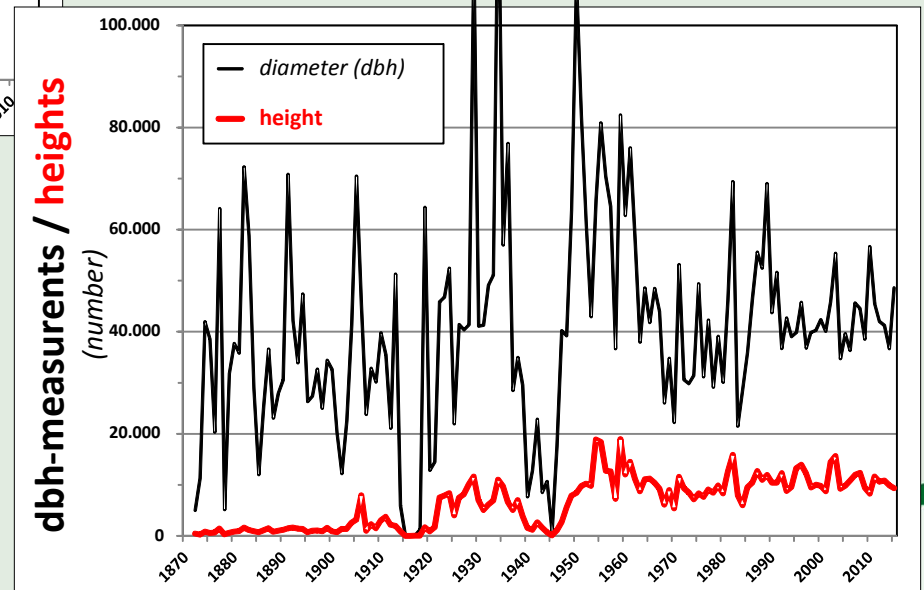
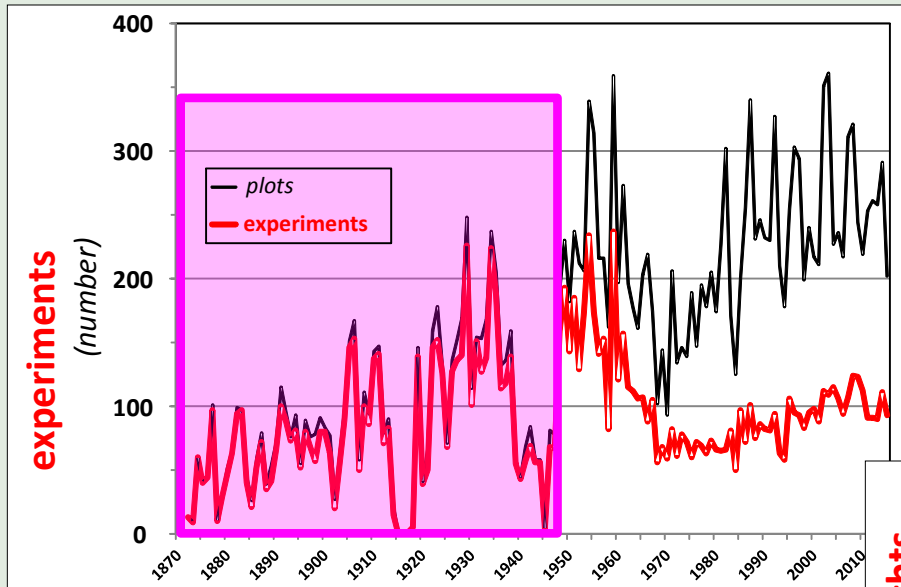
1,500 spruce ha

**wholesale reduction**

# principles: *experiment series*

objectives of experiment series	time frame (duration)	number of plots	area (ha)
<b><u>A) experiments based on modern, quantified crop-tree-thinning concepts</u></b>			
<b>broadleaf species</b> ( <i>Altherr-series etc.</i> )	>40 years	42	<b>12</b>
<b>conifers</b> ( <i>coordinated Dgl-thinning series etc.</i> )	>40 years	22	<b>28</b>
<b><u>B) experiments designed for parametrization of growth models</u></b>			
<b>open-grown-conifers</b> ( <i>Abetz</i> )	>20 years	87	<b>21</b>
<b>broiadleaves: dense - open-grown (Lb-LSD-program)</b>	<b>new</b>	44	<b>14</b>
<b><u>C) management of uneven-aged stands</u></b>			
<b>single-selection-forests</b> ( <i>Plenterwälder</i> )	>60 years	7	<b>4</b>
<b>structure conversion, conifers</b> ( <i>Weise-ÜF series etc.</i> )	>20 years	25	<b>10</b>
<b>structure conversion, beech</b>	<b>new</b>	30	<b>13</b>
<b>long-term group shelterwood</b> ( <i>Weise-Femelse series etc.</i> )	>30 years	32	<b>7</b>
<b><u>D) growth &amp; nutrients</u></b>			
<b>biomass-extraction</b>	<b>new</b>	8	<b>1</b>
<b><u>E) other series;</u></b>			
<b>pre-commercial thinning in dense spruce regeneration</b>	>10 years	18	<b>3</b>
<b>harvesting large-diameter conifer stands</b>	>10 years	24	<b>11</b>

# principles: *data availability (digital database)*



# long-term experiments: “products”

## analyses of particular experiment series (*case studies*)

- **beech** *ALTHERR series*  
target-crop-tree (high) thinning (ALTHERR, FREIST vs. traditional thinning (ASSMANN))
- **spruce** *stem number experiment Norway spruce (IUFRO)*  
influence of spacing & thinning on growth and economic yield
- **Douglas-fir** *provenance series (SCHÖBER)*  
influence of provenance on genetic, growth and stem/crown characteristics
- **Douglas-fir** *coordinated spacing series (ABETZ)*  
influence of spacing & thinning on growth, stem/crown characteristics and economic yield
- **mixed silver fir** *single selection series*  
long-term growth dynamics in stands under single selection management

## analyses based on entire database

- **analyses & models on storm damage** (*treatment sensitive*)
- **growth simulators** (*building & evaluation*)
- **growth trend analyses**
- **environment-sensitive growth models** (*longitudinal data structure*)

## demonstration objects (*excursions, teaching*)