

Masters of European Forestry
Applied Period
Forstamt Johanniskreuz

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Outline

- Introduction to host organization
- Description of tasks and projects

Forest management planning and technical production calculation

Assessments of experimental regeneration treatments

Partial site preparation to enhance pine regeneration

Oak nest-planting

- Host organization reflection, analysis and discussion



Landesforsten Rheinland-Pfalz

Organization:

- Ministry
- **Central office**
- *Forstamt*
- 45 forest districts

Mission:

Forest planning, management,
governance

- Production
- Social benefits/recreation
- Nature conservation



<http://www.wald-rlp.de/index.php?id=3>



Forstamt Johanniskreuz

22380 hectare area

16029 ha state owned forest

3830 ha municipal forests

Predominantly upland sites

Pure and mixed stands of pine, beech, oak, spruce, Douglas fir

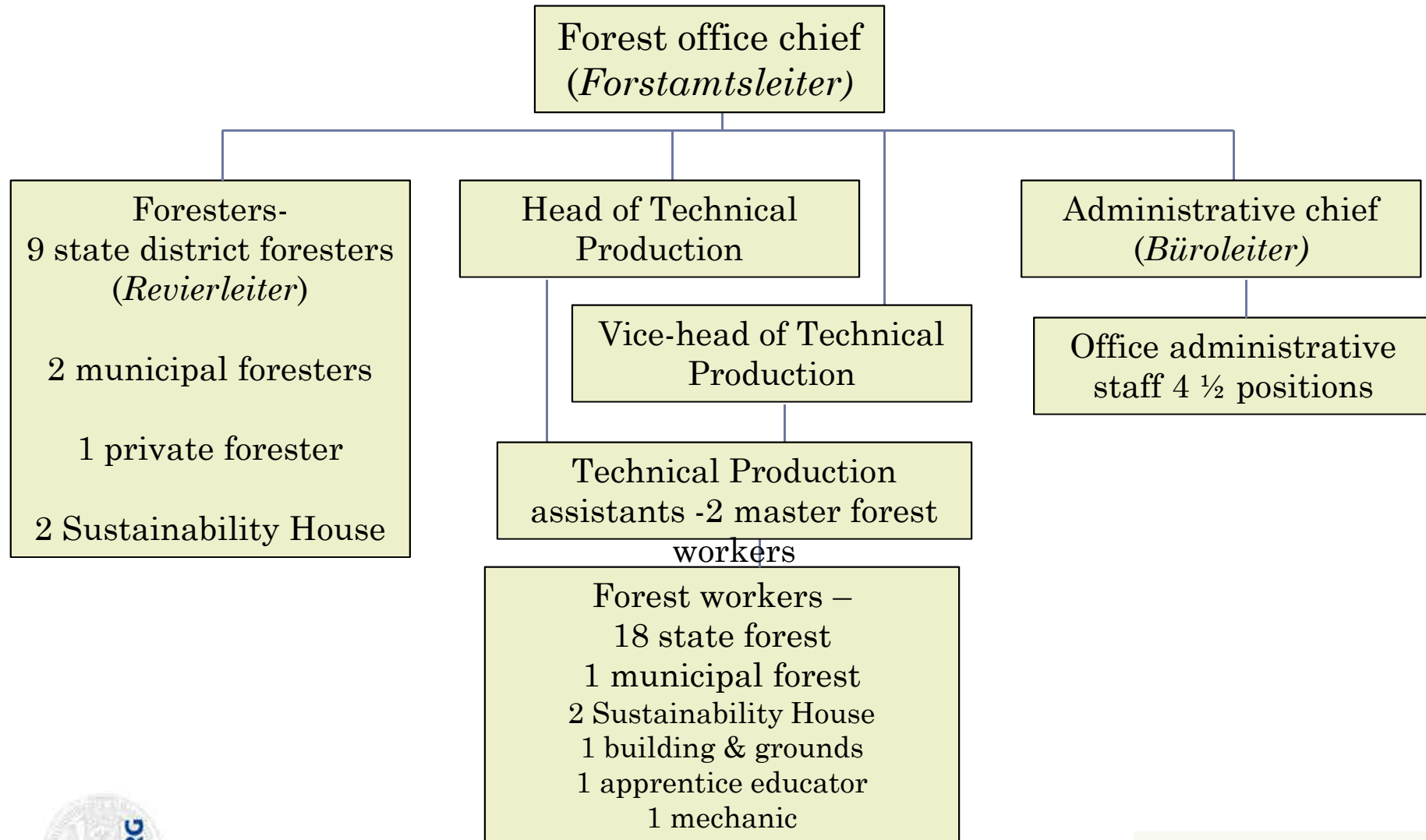
Long history of forest management, infrastructure and organization



<http://www.wald-rlp.de/index.php?id=4349>



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Silviculture and forest management

Integrative, multifunctional model

Crop tree oriented control

Management intensive

Neighborhood-scale

5-8 year return interval (maximum 10)

Large target diameters; 100-250 year rotations



Forest management and technical production in the *Haidedell* stand



Forest management and technical production in the *Haidedell* stand

Crop tree selection and release

Vitality, quality, spacing

Varied silvicultural considerations:

Pure, even-aged beech

Transition to mixed beech-pine

Mixed pine-spruce-Douglas fir

Silver fir natural regeneration

Stem count and volume of trees marked to cut, by species

Species	Tree count	Volume (m ³)	m ³ /tree
Beech	254	90	0.35
Spruce	281	318	1.13
Silver fir	7	15	2.14
Douglas fir	12	28	2.33
Pine	260	265	1.02



Forest management and technical production in the *Haidedell* stand

Operations and oversight

Safety measures

Motor-manual felling

Pre-bunching with cable skidder

Tree-length skidding with grapple skidder

Scaling, grading and bucking



Forest management and technical production in the *Haidedell* stand

Real volume, revenue and costs (inclusive of taxes), by species

Species	Volume (m ³)	Revenue		Costs	
		Total (€)	Vol. basis (€/m ³)	Total (€)	Vol. basis (€/m ³)
Beech	169.48	9254.68	54.61	3381.73	19.95
Spruce	382.14	32264.74	84.43	8561.58	22.40
Silver fir	16.15	1509.03	93.44	312.93	19.38
Douglas fir	32.79	3594.44	109.62	678.78	20.70
Pine	285.47	18498.35	64.80	5930.72	20.78
<i>P. strobes</i>	1.73	124.11	71.74	29.85	17.26
Total	887.76	65245.34	73.49	18895.58	21.28



Pine regeneration survey

Methods

Winter 2007 – 2008:

Harvest -- 1 ha area of 150 year old pine

Spring 2009:

Partial site preparation treatment

18 areas treated, 49 m² (7m x 7m) each

Manual litter removal, root chopping and soil scarification



Pine regeneration survey

Methods

Transect based sample

12 north-south transects

1 m wide, 20 m spacing, ~40 m average length

100% tally within transects

Species

Height

Stem quality (acceptable/unacceptable/coppiced)

Damage (yes/no)

i.e. deer browse

Within site preparation treatment area (yes/no)



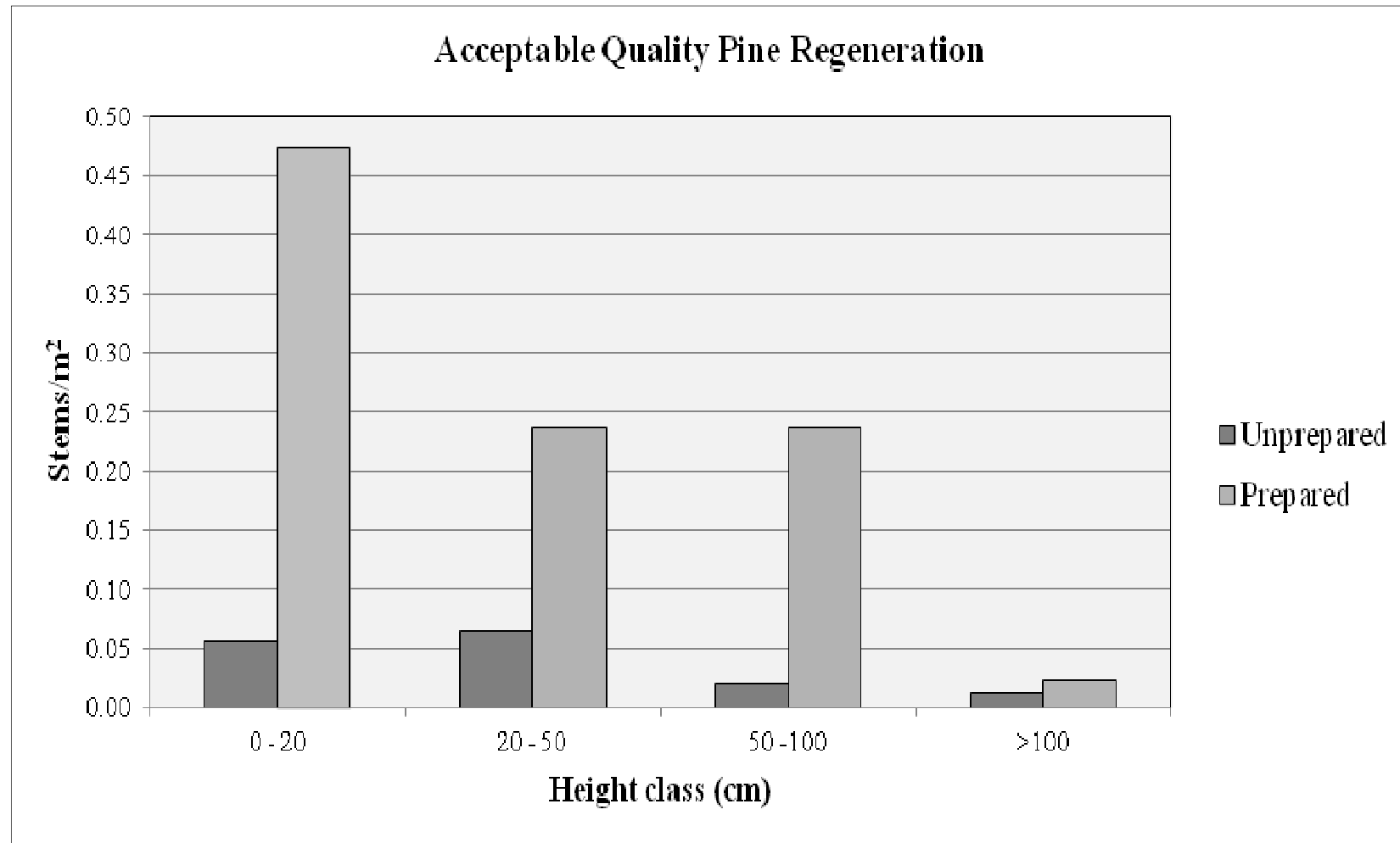
Pine regeneration survey

Results

Species	Count		Density (trees/m ²)	
	Unprepared	Prepared	Unprepared	Prepared
Pine	146	61	0.33	1.44
Beech	65	7	0.15	0.17
Total (all species)	213	68	0.49	1.61
Acceptable quality (all species)	74	42	0.17	0.99



Pine regeneration survey Results



Pine regeneration survey

Discussion

Improved establishment, early height growth – faster full site utilization

Potential to modify size, shape and arrangement of treated areas

Very limited observation and sample – findings should be applied cautiously



Oak nest-planting Background

1989: stand replacing wind storm

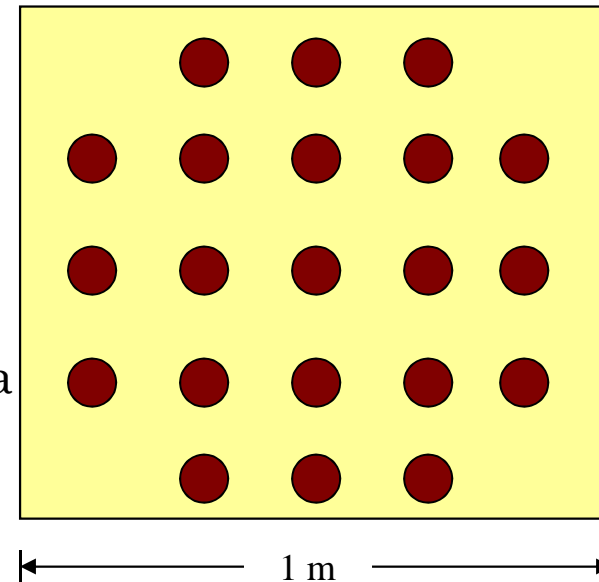
1990: Unsuccessful establishment by sowing

1991: Initial nest planting ~ 100 nests/ha

1993: Supplemental nest-planting ~ 50 nests/ha

1996/1999: Parital tending operations

21 stems/nest



Oak nest-planting Methods

Complete surveyed of nest-planted area

Every potential future crop tree was indentified and marked

Crop trees selection criteria

Vitality

Branching

Straightness

Forking

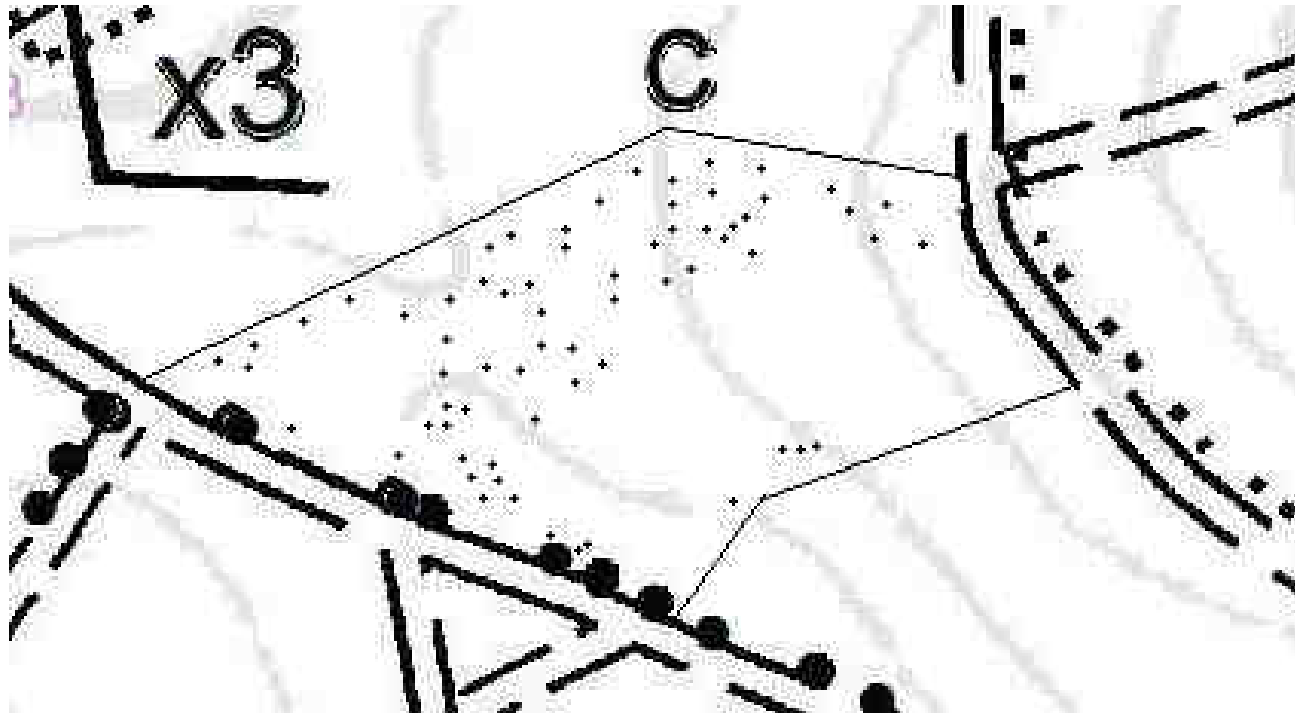
Spacing (10 m target)

Field-estimated locations of all crop trees were marked on a map.



Oak nest-planting Results

64 total crop trees identified



Oak nest-planting Results

Crop tree count by attribute grade, percent within attribute group shown in parentheses

Grade	Vitality	Branching	Straightness	Forking	Spacing
A	18 (28.1)	15 (23.4)	25 (39.1)	35 (54.7)	50 (78.1)
B	27 (42.2)	33 (51.6)	33 (51.6)	24 (37.5)	14 (21.9)
C	19 (29.7)	16 (25.0)	6 (9.4)	5 (7.8)	--



Oak nest-planting Results

Crop tree attribute matrix, excluding option trees

			A-Vitality			B-Vitality			C-Vitality		
			Branching			Branching			Branching		
			A	B	C	A	B	C	A	B	C
A-Forking	Straightness	A	1	1	--	1	3	2	2	1	1
		B	--	3	2	--	1	--	2	2	--
		C	--	--	--	--	2	1	--	--	--
B-Forking	Straightness	A	--	1	--	--	4	1	3	--	--
		B	--	3	1	1	4	2	1	1	--
		C	--	--	--	--	--	--	--	--	--
C-Forking	Straightness	A	--	--	--	1	--	--	--	--	--
		B	--	--	1	--	1	--	--	--	--
		C	--	--	--	--	--	--	--	--	--

Oak nest-planting Discussion

Examination of failure to qualify

Douglas fir competition

Between nests

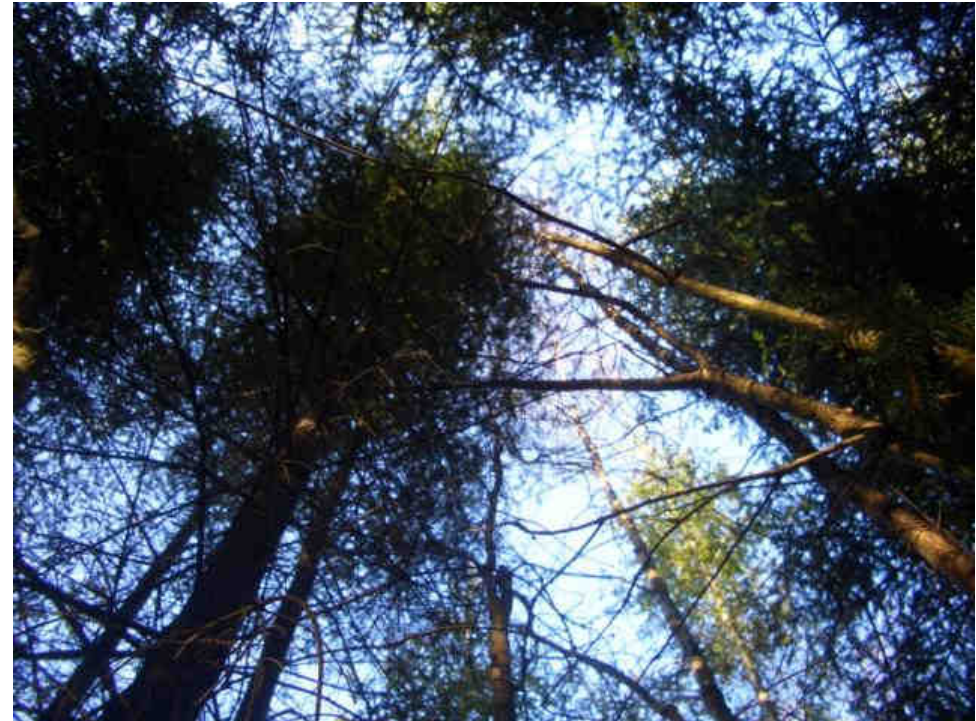
Adjacent stand

Limiting site conditions

Stunted height growth

High mortality

Insufficient natural
regeneration between nests



Lack of side shading from serving
stand



“Apple orchard” appearance



Oak nest-planting Discussion

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Oak nest-planting Discussion

Examination of failure to qualify

Within-nest differentiation and competition

Advantaged stems on nest-perimeter

Strong vigor, height growth crown
expansion

Poor quality

Suppressed nest-interior stems

“V”-shaped nest profile



Oak nest-planting

Discussion

Modifications for future applicability

Stricter site selection criteria

- Limiting site conditions

- Competitive dynamics

Stronger serving stand

- Earlier seeding or direct planting

Oaks of different ages within nest – “A”-shaped initial profile

- Plant older seedling in interior or establish perimeter oaks from seed

Variable within-nest density

Expand from nests to clumps – “W”-shaped profile

- Interior core not suppressed by perimeter stems



Oak nest-planting Discussion

Management recommendations

Uneven spatial distribution of crop trees

--Exclude understocked areas, combine Douglas fir portion with adjacent stand

OR

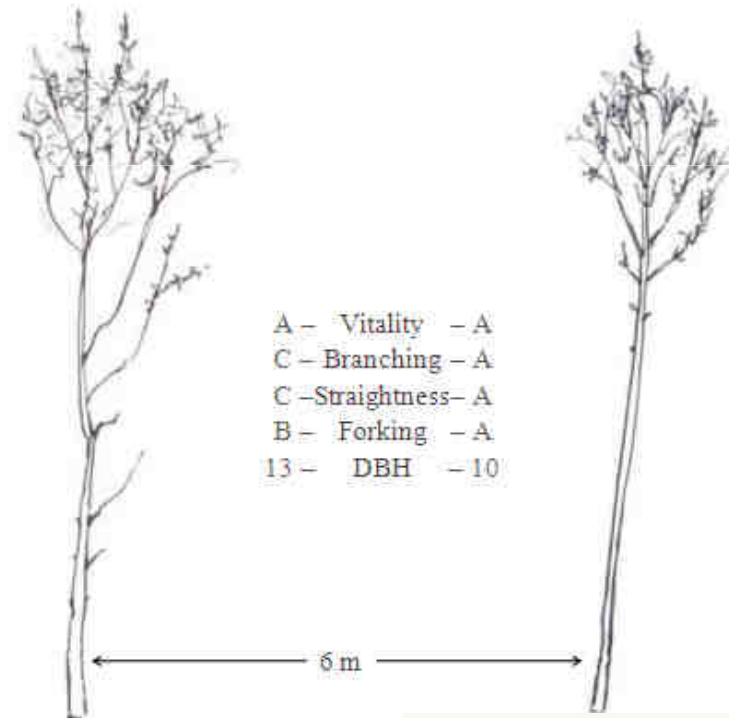
-- manage entire area as mixed, irregular

Relax spacing guidelines

--Promote from option to crop tree
(and prune) if free to grow on 3 sides

--Retain oaks in troupes

--Aggressive release around troupe



Oak nest-planting

Discussion



Tree	Vitality	Branching	Straightness	Forking	Dist. to Tree 1 (m)
1	A	C	B	C	--
2	B	C	B	C	3
3	C	B	C	A	6

Host organization

STRENGTHS

- Tradition and professionalism
- Continuity of management
- Sites suited to growing highest quality oak

WEAKNESSES

- Lack of external trust
- Misinterpretation of public sentiment
- Internal organizational inefficiencies, labor restrictions

OPPORTUNITIES

- Limited– this is good
- Improve management aesthetics to appear more “natural”
- Larger stands, soft edges, fewer roads

THREATS

- Preservationist/segregationist land-use policy
- Skewed internal age structure – foresters are light demanding species



Questions?

