
Applied Period at
Johanniskreuz Forest Office –
State Forest Administration
Rheinland Pfalz, Germany

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SUMMARY

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INTRODUCTION

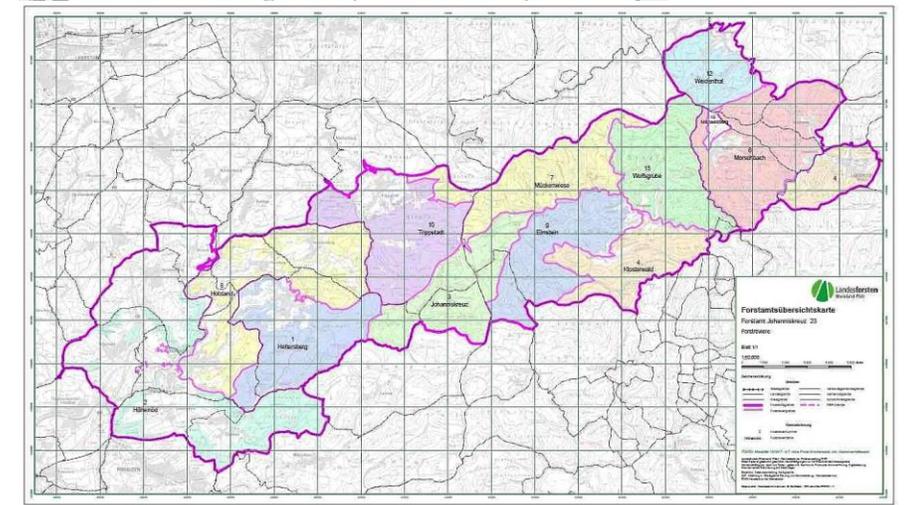
AP in forest institutions MSc European Forestry

3rd June to 2nd August

Forstamt Johanniskreuz:

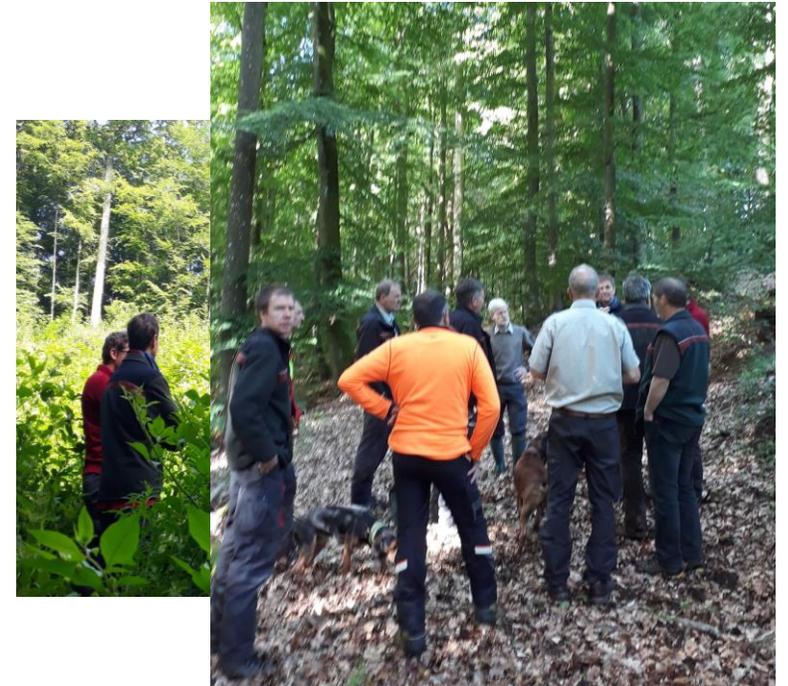
- Rheiland Pfalz State
- Total Area: 22.512 hectares
- Species composition

Specie	Coverage
Beech	29 %
Oak	16 %
Norway Spruce	12 %
Douglas Fir	7 %



HOST ORGANISATION

- ✔ Traditional *Close to Nature* German way
- ✔ Multiple use of forestry :
 - Manage the state forest
 - Support the management of communal forests
 - Give a contractual support on the management of private forests
 - Supervise the compliance with legal forest rules and standards



ACTIVITIES AT THE ORGANISATION

Oak Natural Regeneration

- 🌿 Natural x Artificial
- 🌿 Fragility of oak seedlings:
 - Acorn predation
 - Browsing
 - Insects and fungi pests
 - Select Future Crop Trees (Mast)
 - Remove competing vegetation
 - Fence potential area (€)



ACTIVITIES AT THE ORGANISATION

Silviculture Treatments

- ✔ Natural processes preferred over interferences
- ✔ Silvicultural operations 4 phases:
 - *Establishment Phase*: regenerate the stand with the desired specie, naturally or artificially, by sowing and planting
 - *Qualification Phase*: achieve enough possible future tree, quality and well distributed
 - *Dimensioning Phase*: choose the future crop trees and assist in their development
 - *Maturity Phase*: support the growing of future crop trees, giving them space to grow, longest phase

ACTIVITIES AT THE ORGANISATION

Harvesting Planning

- 🌿 10 years Management Plan
- 🌿 Forest ranger Annual plan
 - manual vs. mechanized
 - own employees vs. contractors

Hunting

- 🌿 Terminal shoots, seedlings and acorns are eaten
 - Roe Deer (*Capreolus capreolus*)
 - Red Deer (*Cervus elaphus*)
 - Wild Boars (*Sus scrofa*)



ACTIVITIES AT THE ORGANISATION

Grading System

- 🍃 The classification depends on log quality, color, straightness, defects, mineral deposits

A – Excellent quality (veneer, barrel)

B – Normal quality

C – Middle quality

D – Poor quality

Quality sorting for logs: Oak sorting table				
Characteristic	Quality			
	A	B	C	D
Epicormics	allowed 1 je 2 m	allowed	allowed	allowed
Defomities	unallowed	1 je 2 m	allowed	allowed
Twisted grain	≤2	≤6 bis 4.Stkl. ≤7 ab 5.Stkl.	unlimited	unlimited
Incomplete hardwood	unallowed	unallowed	unallowed	allowed



INDIVIDUAL PROJECTS

- ✔ Cover the most important activities carried out here
- ✔ Personal interests
- ✔ The projects were carried out separately along my staying in Johanniskreuz
 - PROJECT 1: Oak Natural Regeneration
 - PROJECT 2: Harvesting Operation Monitoring
 - PROJECT 3: Stand Marking and Volume Calculation

Project 1 - Oak Natural Regeneration

🌿 Objective:

- To mark Beech trees that should be cut in order to give space and light to oak seedlings to grow
- To analyze and measure the development of oak natural regeneration, by implementing some transects and plots

🌿 Fenced area (1,5 ha)

🌿 5 transects (20x20)

🌿 3 plots (2x2)



Project 1

- 🌿 South coordinate
- 🌿 Strong competitor
- 🌿 Too much branches



Project 1

Identification	# of Seedlings	Vitality	% of Cover	Height Range
	98	M		
	134	M		
	177	M		
	79	L		
	25	L		
	22	L		
	63	M		
	54	M		
	67	M		
	71	M		
	104	M-		
	65	M		
	58	M-		
	39	M		
	61	M		

Project 2: Harvesting Operation Monitoring

Objective:

- Time and Movement Study
- Harvesting Operation Cost

The activities considered in the dynamics of this operation were:

MD – Machine Displacement: considered the displacement of the machine in the site

CD – Crane Displacement: considered the displacement only of the crane in direction to the tree

HHP – Harvester Head Positioning: Refers to the positioning of the harvester head to start the tree feeling

FE – Felling: referred to the activation of the chain until the complete feeling of the tree

PR – Processing: it was considered as the time which the rollers and knives slid over the tree trunk

TP – Technical pause: considered time spent with current adjustment, personal break

Project 2



Observations	MD	CD	HHP	FE	PR	TP	Total	TIME (min)
1	107	88	39	63	32	25	354	60
(%)	30,23	24,86	11,02	17,80	9,04	7,06	100	
2	82	47	19	17	1	22	188	31
(%)	43,62	25,00	10,11	9,04	0,53	11,70	100	
3	114	100	40	55	18	180	507	84
(%)	22,49	19,72	7,89	10,85	3,55	35,50	100	

Project 2

HARVESTER				
A Input data				
Purchase price of the complete machine incl. assembly and transfer costs, accessories, discounts, discount excluding VAT	An		310,00	€
Residual	R		88,571	€
Obsolescence in years (max. useful life)	N		7	Years
Total technical useful life in MAS	H		27,000	MAS
Depreciation period in years	Aj		5	Years
Depreciation period in MAS	Amas		19,286	MAS
Load threshold H:N	Sw		3,857	MAS/Year
Estimated annual utilization (MAS/year)	a		1,500	MAS/Year
Fuel consumption in l/MAS	Kv		10,00	l/MAS
Fuel costs incl. transport and storage	Kk		1,30	€/l
Factor for repair and maintenance	r		1,10	
Factor for lubricant costs	sm		0,25	
Interest rate in %	i		8,00	%
B Material costs		€/Jahr	Summe	€/MAS
Depreciation A			38,41	€/MAS
If a greater or equal to Sw, then (An-R):Amas				
If a is less than Sw then (An-R) : (Aj x a)			29,52	€/MAS
Financing (A+R) : 2) x 1 % :100	Σ	15,942,86	10,63	€/MAS
Maintenance costs (RW) (To : H) x r			12,63	€/MAS
Operating material costs (B) Kv x Kk x (1 + sm)			16,25	€/MAS
Transfer, arrival and departure/year	Σ	12,225,00	8,15	€/MAS
- Material costs (machine costs, low loaders, car kilometers): 2 €/MAS		3,000,00		
- Wage costs (driver's wage, trigger): labor costs € x 0.15		9,225,00		
Other costs/year (S)				
differentiated estimate	Σ	31,840,00	21,23	€/MAS
- Liability insurance		700,00		
- Technical machine insurance 1.4% of Na		4,340,00		
Accommodation		0,00		

TOTAL HARV. OPERATION TIME	02:55:00
TECHNICAL PAUSE	00:08:00
EFFECTIVE HARV. OPERATION	02:47:00
COST OF HARV. OPERATION/PMH	€ 139,41
TOTAL COST OF HARV. OPERATION	€ 387,56
TOTAL # TREES HARVESTED	227
TREES HARVESTED/PMH	81,65
TOTAL REVENUE	€ 227,00
REVENUE/PMH	€ 81,65
TOTAL PROFIT	- € 160,56
PROFIT/PMH	- € 57,76

KWF Institute – Machine Cost
Calculation Guideline

Project 3: Stand Marking and Volume Calculation

🌿 Objective:

- To prepare 2 stands to be harvested
- Propose the best harvesting method



Project 3

Regular Cost		Additional Cost (Harvester + Skidder)	
Ind. Volume	Price (€/m3)	Ind. Volume	Price €
0,41 - 0,49	€ 13,85	0,50 - 0,59	€ 4,49
0,50 - 0,55	€ 13,59	0,60 - 0,69	€ 4,29
0,56 - 0,60	€ 13,33	0,70 - 0,79	€ 4,09
0,61- 0,70	€ 13,06	0,80 - 0,89	€ 3,80
0,71 - 0,80	€ 12,81	0,90 - 0,99	€ 3,23
> 0,81	€ 12,54	>100	€ 2,73

Species	Product	Price (per m ³ , rm, t atro)	Conversion Factor	Price after Conv. Factor
Pine (Ki)	AB+	€ 65,00		
Pine (Ki)	AB-	€ 33,50	0,65	€ 51,54
Pine (Ki)	Ind. Wood	€ 70,00	2,1	€ 33,33
Pine (Ki)	Pallet	€ 57,50		
Beech (Bu)	Ind. Wood	€ 60,00	1,5	€ 40,00
Beech (Bu)	Pallet	€ 55,00		

Project 3

STAND 1

Manual Harvesting Method Cost:	18,16 €/m ³
Mechanical Harvesting Method Cost:	15,10 €/m ³
Pine Revenue (Manual Harvesting Method):	40,58 €/m ³
Pine Revenue (Mechanical Harvesting Method):	58,46 €/m ³
Beech Revenue	50,5 €/m ³
FINAL MANUAL HARVESTING METHOD PROFIT:	29,44 €/m³
FINAL MECHANICAL HARVESTING METHOD PROFIT:	37,72 €/m³

STAND 2

Manual Harvesting Method Cost:	19,87 €/m ³
Mechanical Harvesting Method Cost:	15,57 €/m ³
Pine Revenue (Manual Harvesting Method):	40,58 €/m ³
Pine Revenue (Mechanical Harvesting Method):	58,47 €/m ³
FINAL MANUAL HARVESTING METHOD PROFIT:	20,71 €/m³
FINAL MECHANICAL HARVESTING METHOD PROFIT:	42,90 €/m³

CONCLUSION

🌿 PROJECT 1:

- Size of gaps and light are related to success of natural oak regeneration
- Fencing regeneration areas, marking future crop trees and cutting competitors trees have being effective measures so far (€)
- Keep searching for new solutions and methods to improve the natural oak regeneration

🌿 PROJECT 2:

- To delineate well the machine and crane displacement, optimal solution
- Main goal of helping with the site vulnerability, this smaller productivity was already expected
- Harvesting operational costs, as expected, the profit was not positive

🌿 PROJECT 3:

- Mechanical harvesting method seems to be the most profitable one in both stands
- Selling of wood in different assortments, harvester machine over a chain saw is the most productive option

SWOT ANALYSIS

STRENGTHS

- Close to nature management
- One of the highest productivities in Rheinland-Pfalz State
- High Species Stand diversity
- Experienced Forest Rangers

WEAKNESSES

- Lack of communication (English speakers)
- Technology in forest operations
- Reduced number of workers
- Disagreement with the proposed 10-year Mng Plan

OPPORTUNITIES

- Improve technological level in forest operations
- Bioeconomy Trends
- Cooperative elaboration of the Mng Plan with the responsible government authorities
- Review of Forest Office structure

THREATS

- Bark Beetle attack
- Market Price oscillation in the next 2 years
- Oak natural regeneration development
- Forest Management Plan lacks

Danke dir sehr!

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