

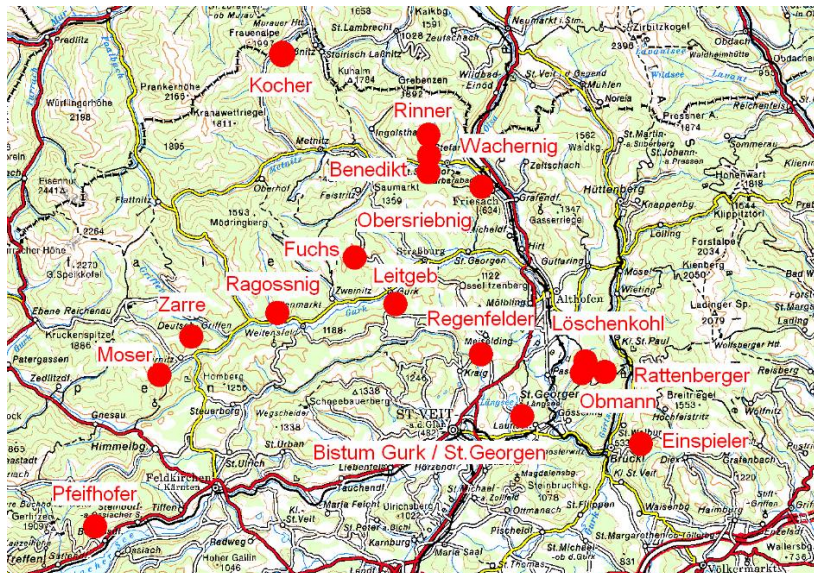
**Pro Silva Europe - Annual Meeting 2011**  
**Field Trip 3 - 18.06.2011**  
**"Sunstainable forest management in the region of "Mittelkärnten"**  
**"Silvicultural treatment in cable crane-terrain"**  
**Family forest enterprises:**  
**Helmut Wachernig vlg. Oberer Eicher (St. Salvator)**  
**Dietmar Rinner vlg. Baar (Timrian/Grebenzen)**

Themes: Presentation of small scale mixed forests enterprises,  
nature based forestry in farm-forests

**Leader+ Project:**  
**Sunstainable forest management in the region of "Mittelkärnten"**

Project Overview:

- Duration 2004-2006 – Financial contributions of the participants and working hours
- Network of 16 mixed forest farms as leader enterprises (urban forest owners, women, 1 big enterprise)
- Forest Management Planning and consulting (1100 ha, cooperational planning), Maps
- 50 example areas for silvicultural treatment, 16 permanent sample plots (rectangles)
- Training: 18 excursions, intensive practical exercises, 8 workshops - >600 participants
- Cooperation between the farms (machines, human advice, work in the forest), cooperation with wood processing enterprises (sawmills, specialist for large diameter timber)
- Links to Science: Institute for Silviculture (student excursions, project "factory of the future"), Forest technology (study about Savall 1500 small cable crane system), diploma thesis "forest growth simulation in sample plots" Links to public: newsletter, open presentations and events ( ca. 300-500 participants), public relation work, television spot, contact to periodicals in forest and farms

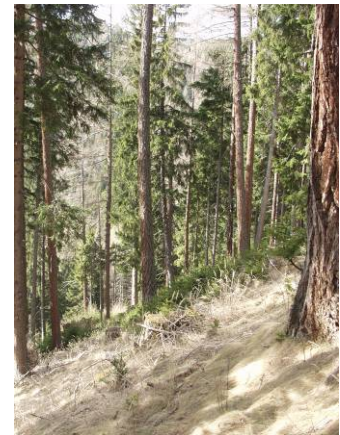


## Helmut Wachernig vulgo Oberer Eicher (St. Salvator)



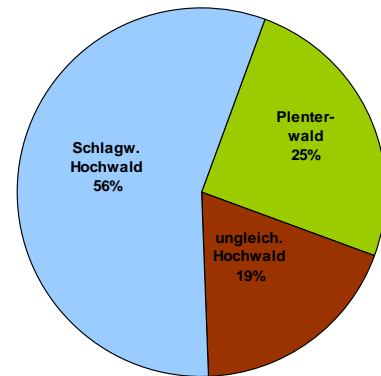
### Basics of the Farm

- total area 154 ha, with 98 ha forest land, 51 ha farmland;
- elevation a.S.: 700 bis 1600 m; annual precipitation: ~ 800 mm/year; annual mean temperature: 8,5° C;
- geology: limestone - mica slate
- agriculture: since 1990 organic farming, mother cows, pastures, fields for own requirements



### Forestry:

- since 1990 clear cut free silvicultural systems, migration to plenter systems
- 56 % of forest area: even aged forests; ~ 26 % plenter structured and 19 % uneven aged.
- high percentage of mature stands - 504 fm /ha (~ 600 m<sup>3</sup> in district "Walk")
- because of high quota of primary planting (on former farmland) and natural successions minor average quality of timber



|                   | Eicher      | Walk       | Peinte     | Gesamtbetrieb |
|-------------------|-------------|------------|------------|---------------|
| VfmS/ha           | 439         | 591        | 450        | 504           |
| G/ha              | 36.7        | 46.6       | 43.1       | 42.1          |
| N/ha              | 865         | 722        | 871        | 807           |
| dg                | 23.2        | 28.6       | 25.1       | 25.8          |
| hL                | 26.7        | 29.1       | 24.2       | 27.3          |
| Einzelbaumvolumen | 0.507       | 0.818      | 0.517      | 0.625         |
| H/D               | 115         | 102        | 96         | 106           |
| IGZ(VfmS/Jahr/ha) | <b>12.6</b> | <b>9.6</b> | <b>7.7</b> | <b>10.3</b>   |

- 8% young growth (till 20 y), 50% thinning stands (till 60y), 23% middle age stands (60-100J), 19% mature stands (>100y)

| ehemalige Nutzung | [ha]  | Anteil |
|-------------------|-------|--------|
| Waldweide         | 44,7  | 41%    |
| Streunutzung      | 2,6   | 2%     |
| Streuwiese        | 2,6   | 2%     |
| Weide             | 8,3   | 8%     |
| Mähwiese          | 6,0   | 6%     |
| Acker             | 3,0   | 3%     |
| Keine besondere   | 40,7  | 38%    |
| Summe             | 108,0 | 100%   |

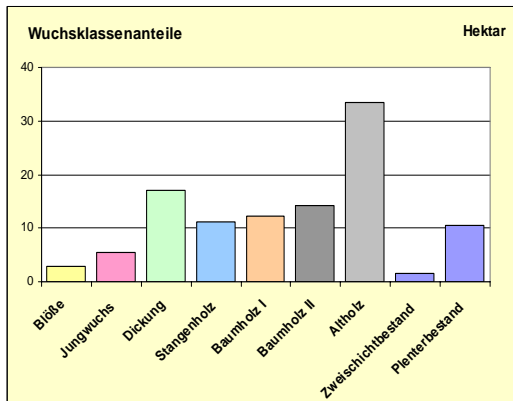
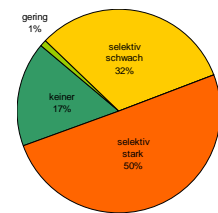
### History of the forest stands

- 15 % primary plantings on former farm land, 16 % natural successions of vegetation.
- More than 60 % of the forest has been influenced by grazing of cattle/sheep or other historical forest utilizations

**Forest roads, logging situation:**

- ca. 77 lm/ha roads for timber trucks
- just 14 lm/ha tractor routes
- 75 % of forest area: cable crane terrain (over 40 % inclination)
- Small scale cuttings with cable crane system Savall 1500 (in cooperation)

Browsing by Game



| Baumartenanteile | [ha]  | Anteil |
|------------------|-------|--------|
| Fichte           | 78,24 | 75%    |
| Lärche           | 21,05 | 20%    |
| Kiefer           | 0,18  | 0%     |
| Ahorn            | 0,30  | 0%     |
| Esche            | 3,85  | 4%     |
| Schwarzerle      | 0,29  | 0%     |
| Birke            | 0,21  | 0%     |
| Eberesche        | 0,1   | 0%     |
| Gesamtergebnis   | 104,2 | 100%   |

**Excursion route:**

**Stop 1:**

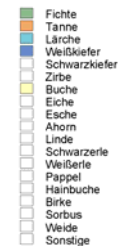
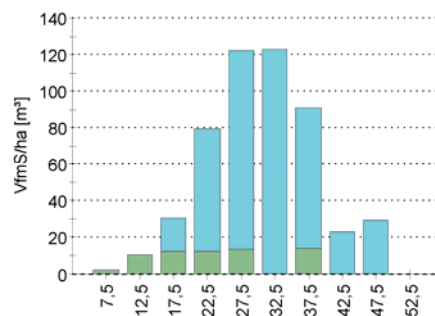
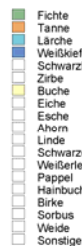
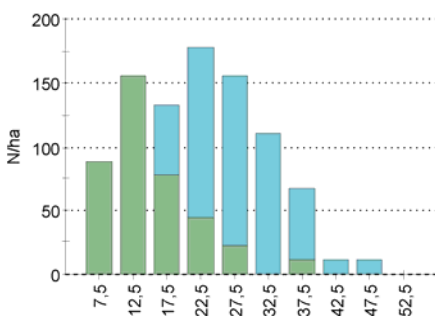
- at the farm - welcome; common presentation of the mixed farm enterprise
- presentations of the forest area (sizes, distribution, key aspects)
- field trip to area "Walch"

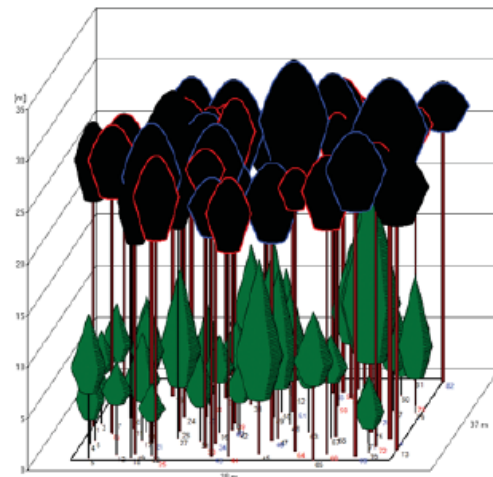
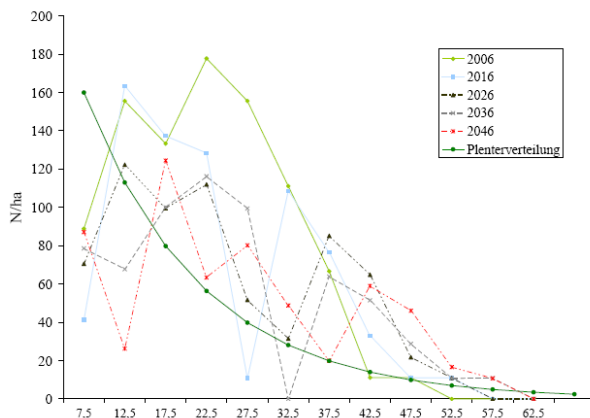
**Stop 2:**

- high structured mature larch-spruce stand with young spruce in primary stage
- stand development and forest treatment
- utilization of larch resin (techniques, crop amount)
- permanent sample plot as a case study

**Permanent monitoring plot**

- Monitoring and simulation of forest growth under cultivation
- All trees measured and judged: Coordinates, BHD, H, Quality, silvicultural treatment (e.g. future crop tree)





Most important facts:

- Growing stock = 510 m<sup>3</sup>/ha, N/ha = 911
- Very high h/d-ratios: Nearly all trees above 80, lots above 120
- Very short crowns
- High stem-qualities

### Stop 3:

- forest roads and infrastructure
- general sanitation- techniques and costs / lm

### Stop 4:

- Site: altitude: 1300m, sunny side, canopy closure, keep local climate fresh
- History: Willow-forest + charcoal, germination conditions very good for larch
- Spruce-Larch mature stand, very sparse because of wind in 1990
- Perfect Larch-regeneration
- Structures through "tiny" catastrophes
- Using coincidences to preserve the larch
- Capacity of the rest of the stand (height, increment), genetics

### Stop 5:

- Stand age: Spruce: 140 years, Larch until 230 years
- Usage in 2002 and 2004
- Harvest 2004: 110 m<sup>3</sup> (100 m<sup>3</sup> round timber). harvested about 18 % of the growing stock (age, quality)
- Missing structure because of clearing out
- Browsing by game: Tract (tree species: Larch, maple, fir?)

### Goals:

- Initiation of natural regeneration
- Aiming two layered stand
- Canopy closure as long as possible by mature wood
- Reaching the target diameter in most mature stands
- Regeneration of larch in gaps (natural or artificial)

## Stop 6:

- Windthrow at the scarp
- Rest of the stand an use of the shadow
- Afforestation: fir, larch
- Thinning strategy

## Dietmar Rinner vulgo Bar (Timrian/Grebenzen)



### Basics

- **Altitude:** 1020-1450m; **Slope:** WF 30-65%, PF 55-120%; **Precipitation** about 800 mm/a; **geology:** limestone
- **History:** for 278 years in property of the family. 1958 after 92-years resettled by parents
- **Area:** 116 ha, 20 ha agriculture, 96 ha forest; 34 ha protection forest, 22 ha



object-protection forest ; 2008: purchase of 29 ha forest to reach the size of a private hunting district

### Forest development:

- **Cuttings to pay heritages:** 8,5 ha (ca. 1958-62); followed by 2 ha windthrow, Focus since 1970 care for regeneration, pre commercial and commercial thinnings;
- **Construction of roads:** 1977: first truck-drivable road (2,8 km); since 1980 to 1984 Finishing of forest-road, 2005 Finishing tractor trails; 2007 Sanitation of the 1980 build road;
- **Road Infrastructure:** 8,8 km forest roads (ca. 89 lm/ha); lower class roads (tractor trails/skidding trails): 3,48 km (ca. 30 lm/ha)
- **Windthrow and snow breakage:** 1979-80 windthrows, snow breakage; 1990 windthrow: 6 ha; ( 40% in mature stands, 60 % in 30 – 40 year old stands); downslope winds + east-winds increasing problem
- **Forest history:** only in lower region ap.3 ha former acre (2 stands), rest: former wood; forest-willows until 1974 in the lower (forest edges)(50-100 m), 1974/75 Splitting of willow and forest
- Since 1977: **barking** - a serious problem until today

### Enterprise advancement

- Until middle of 19. century: production of charcoal for firering of limestone– Limestone mined at 1400 m altitude.
- 1958 resettlement: Electrification, building of the house
- 1962 Starting to breed "Fleckvieh" (cows)- Milk to the dairy St. Veit/Glan
- 1968 Foundation member of the "Maschinenring" – first additional incomes

- 1988 Taking over the management - Beginning of hoof-trimming (ap. 20 clients)
- apprenticeship for professional hoof-trimming with international appreciation 2005
- 2004 Project Sustainable forest management in the region of "mittelkärnten" - Study on the Savall 1500
- 2005 Founding the local heating St. Salvator, 2007: 3. expansion
- 2008 Additional purchase of 29 ha - reaching the size of a private hunting district
- 2011 Founding the firm "Rinner Klauenpflege OEG"

## Near Nature Forestry

- Until 1980 "strip-femel system"; since 1980 just single tree cuttings; since 1997 target diameter cuttings.
- **Establishment of clear cutting free silviculture:** Age-class forest is no advantage in steep terrain (cable crane should be profitable); 1980: wind- and snow breakages => not all stands cleaned up, cultivation of spruce and larch below canopy; natural regeneration in the shadow, autochthonous genetics!
- Since 1980 **Focus** on thinnings and single tree cuttings
- **Logging methods:** Logging by Tractor (on the ground) and logging by hand (very little percentage), some loggings combined harvester and cable crane, Development of a small cable crane system (1997-2001)
- **Working capacity::** Father and son + adjutant (ca. 40 – 50 h/a). – 2,2 workers at the farm
- **Actual Annual harvest:** 350 m<sup>3</sup> per year; (200 m<sup>3</sup> thinnings, 150 m<sup>3</sup> final cuttings), Sold in cooperation with the WWG (cooperation of forest owners)

## Field trip

### Stop 1: Silvicultural treatment

- Single tree cuttings - natural regeneration in cable crane terrain
- Preparation for hunting purposes

#### Benefits

- Preserving locally approved mature stands
- Adaption to small scale characteristics of genetics
- Preservation of regeneration through canopies of seed-trees
- Higher resistance against pine weevil (*Hylobius abietis*)
- Better structures - good possibility to select suited trees
- Lower planting - costs

#### Disadvantage

- Dependency on fructifications and seeds
- Patchy regeneration structure

**Important:** Prior sober-minded look at the logging situation and the ecological framework condition

**Natural regeneration Yes - but knowing how and knowing where!**

## Stop 2: Logging techniques

- Thinning in 1998, cable line, structure, harvest ap. 35 m<sup>3</sup>/ha
- Left side: 1989: removing of canopy trees - logging by hand, damaged trees not removed - precommercial thinning in 1997
- Right side: Harvest in winter 2011: "strip cutting" concerning regeneration - logging by hand?
- Natural regeneration and light demanding trees - larch?
- Logging methods and limitations (cable crane), Tree selection, felling direction and felling techniques - up to 40 m, if supports are available

## Stop 3: Forest road network

- Infrastructure: tractor trails, skidding trails and cable lines in cable crane terrain
- counter ramp: first cable crane in use in 1990: "KSK 16, K300" - Motivation and gaining of know-how of different cable crane systems
- Small scale cable crane system Savall 1500 P

## Main results of Savall study

- Goal: productivity model and cost calculations for application in small scale enterprises for natural based forestry
- Influence of volume/piece, number of logs, distance, pulling distance from the side and harvest percentage – creating a model
- relatively low increase of productivity with different harvest percentages – primary use in small area or single tree cuttings
- short installation time => break even point even with 4-8 m<sup>3</sup>/cable line
- costs per hour (3 men, cable system + tractor, 300 hrs.) ~ 50,- € /h
- maximum cable length 300m, carrying capacity 1,5 tons

### recommendations:

- working squad: 3 men, well educated
- investment in cooperation of 2-4 farmers, capacity utilization min. 300 hrs./year
- cooperation of the forest owner is possible and helps to reduce costs
- distance between cable lines 20-30m, felling must be according to the position of the lines
- application for small scale und single fellings (thinning, single selection, plentern)

## Stop 5: Tree selection

- Preparation of harvesting - Selection of single valuable trees
- Removal of besiegers and bad qualities

## Stop 7: Fence

- Potential regeneration behind the fence - browsing of seeds
- Potential natural forest type
- Chances and challenges for the hunter – barking as a main problem

### Stop 6: at the farm

- Branches of the enterprise: cattle breeding, forestry, energy production – micronet bioenergy St.Salvator, hoof trimming – new firm
- 2,2 working persons at the farm, there from 0,7 persons for external service

#### branches of the farm:

- Evelin - cattle breeding
- Thomas - forest & hunting
- Dietmar - silviculture & hoof trimming as service for 150 farms

#### personal guidelines:

- place of work for 2 families
- living together of 3 to 4 generations
- respect & consideration for each other
- joint gratification about success / joint fun is double fun !
- joint challenge about the economical and political framework
- joint orientation for the future
- development of personal talents and strength

*(Konzeption: Dietmar Rinner, Helmut Wachernig Eckart Senitza, Roland Gutzinger 2004-2011, translation E.Senitza, R.Gutzinger)*