Growth and silvicultural potential of *Lomatia hirsuta* forests from stump shoots in the valley of El Manso/ Patagonia/ Argentina

PRESENTATION FOR THE 1ST INTERNATIONAL ELECTRONIC CONFERENCE ON FORESTS

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Introduction

- In the valley of El Manso there are great pure stands of *L. hirsuta*, which is unusual
- The stands originated from stump shoots after forest fires
- The wood of *L. hirsuta* is very attractive because of its colourful appearance and its good workability
- There are no references that silviculture is done somewhere with *L. hirsuta*, the traditional use is as wood pasture (“parquizado”)

Introduction

The objectives were:

- Improve the quality wood production evaluating the actual conditions of vigour and quality
- Studying the growth of the best trees

Articles of wood of *L. hirsuta* offered on a regional market

L. hirsuta stand with the traditional use as wood pasture („parquizado“)

Material and Methods – Study area

- Study Area: El Manso Valley in the north-west of the Province of Río Negro (Patagonia, Argentina), near the limit to Chile
- Climate: cold temperate, good conditions for tree growth
- Annual mean temperature: 9.3 °C; Precipitation: 1,600 mm per year
- Soil typ: Andosol (from volcanic ash), very rich soil, cation exchange capacity and water storage capacity are increased by allophane

The soil profile in the young stands

Material and Methods – Data acquisition

- Four different structures: young, intermediate and old stands and the parquizado
- 3 parcels per structure (1,000 resp. 300 m^2)
- Measuring all DBHs and some hights of the stems inside the parcels
- Stem description concerning health condition, social position and form
- Measuring mid-diameter and length of quality logs
- Simulation of a crop tree orientated and a catch-up low thinning
- Selection of three trees per structure for trunk analysis

Young

Intermediate

Old

Measuring quality logs with a Finnish parabolic caliper

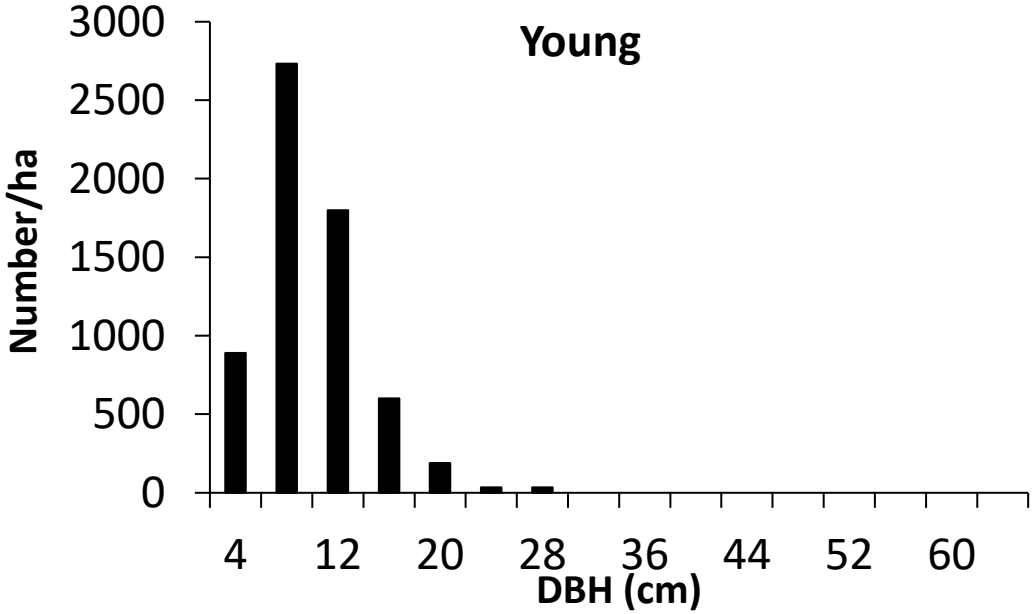
Material and Methods – Processing and data analysis

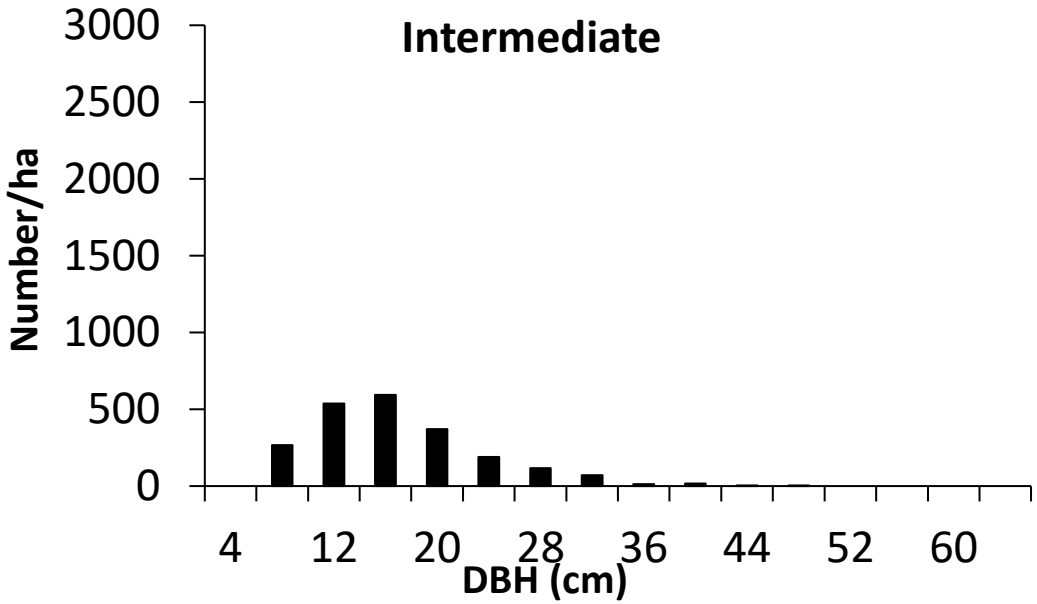
- Hypsometric curve and a diameter distribution
- Generate total and stem volume equations
- Volume of the stands
- Competition index (A value) and growth of crop trees analysis
- h/d ratio, height, diameter and volume relation to age of crop trees

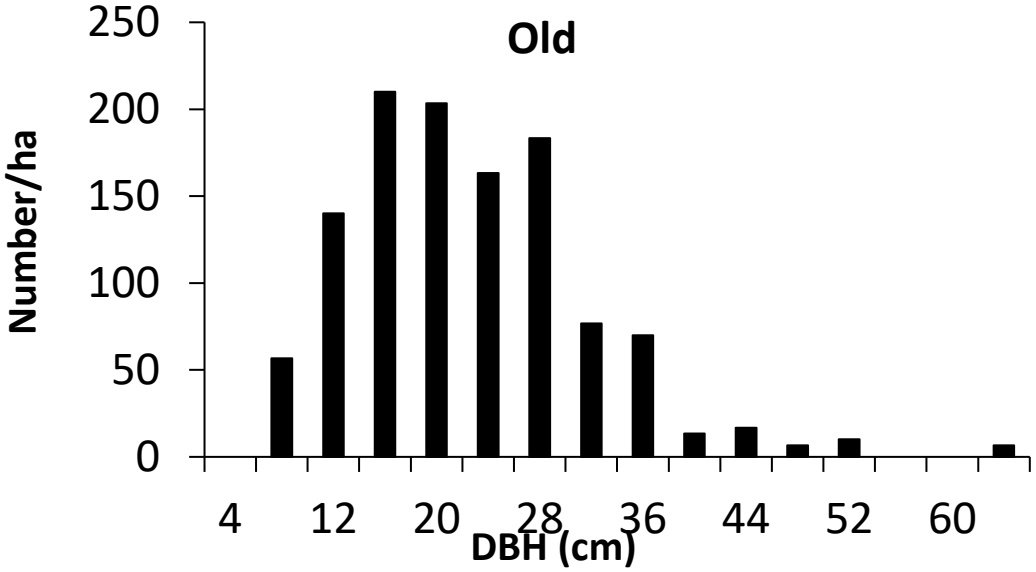
Results – Structures of the stands

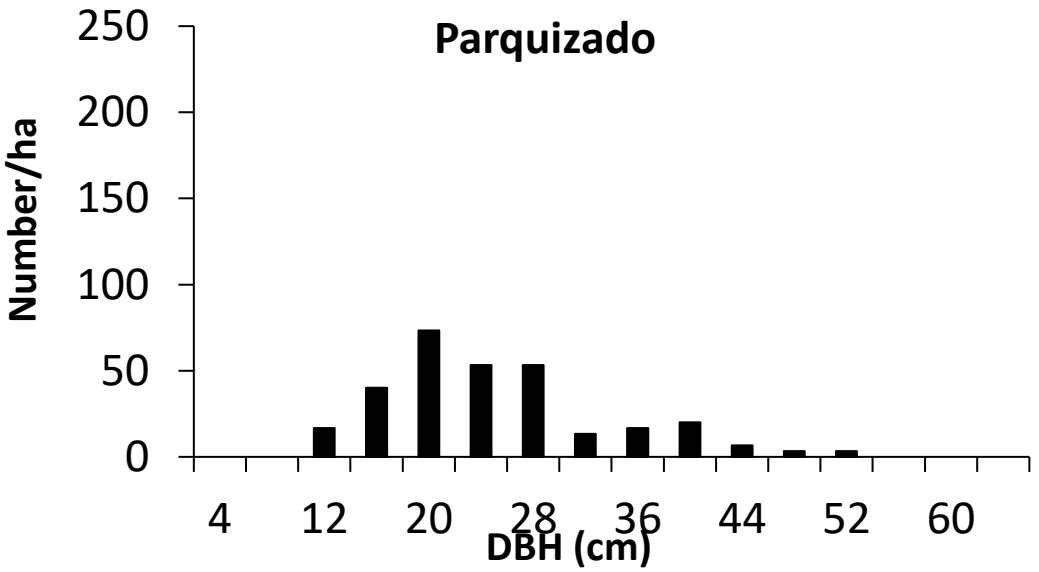
Variables	Young	Intermediate	Old	Parquizado
Number of trees/ha	2.244	1.167	600	223
Number of stems/ha	6.278	2.180	1.157	300
Number of stems/tree	2,9	1,9	1,9	1,3
Mean square diameter [cm]	10,7	18,2	24,5	26,8
Dominant height [m]	12,6	16,4	18,2	16,7
Basal area [m^2/ha]	56,1	56,9	54,4	16,9
Total volume [m^3 o.b./ha]	553	560	536	166
Volume of mature stems [m^3 o.b./ha] *	24	173	249	82

* DBH ≥ 20 cm



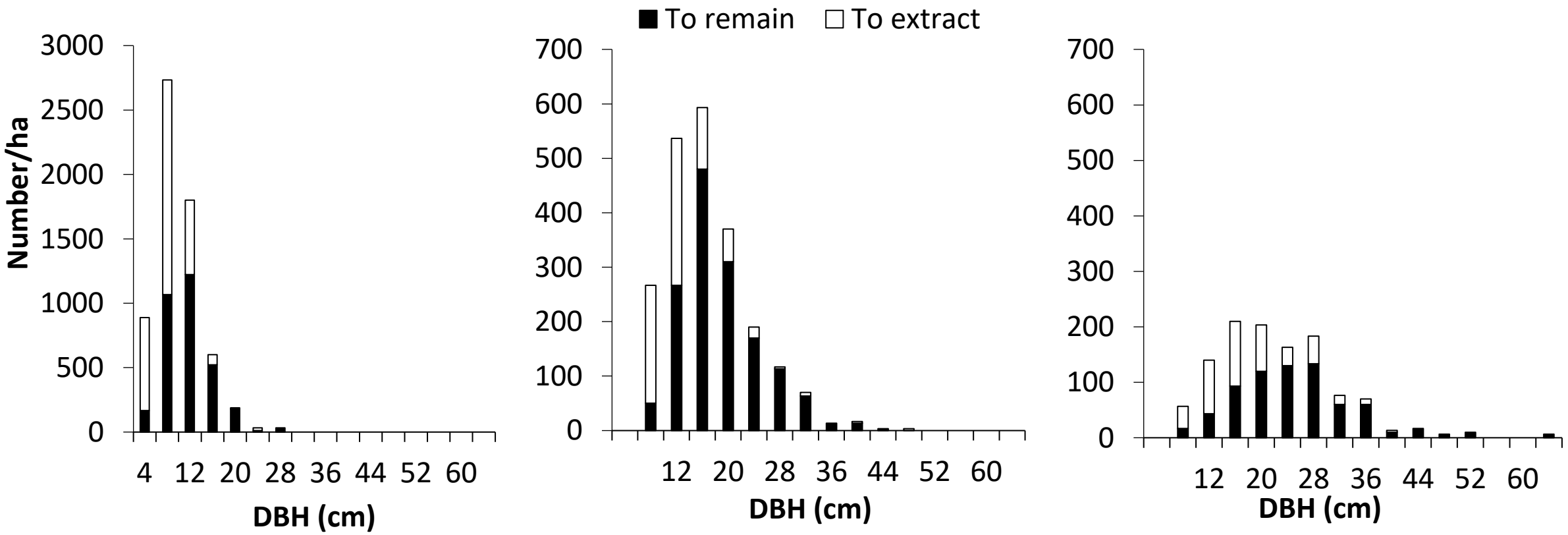






Diameter distributions of the different structures

Results – Thinning simulation



Number of stems to extract and to remain in the thinning simulation per diameter class

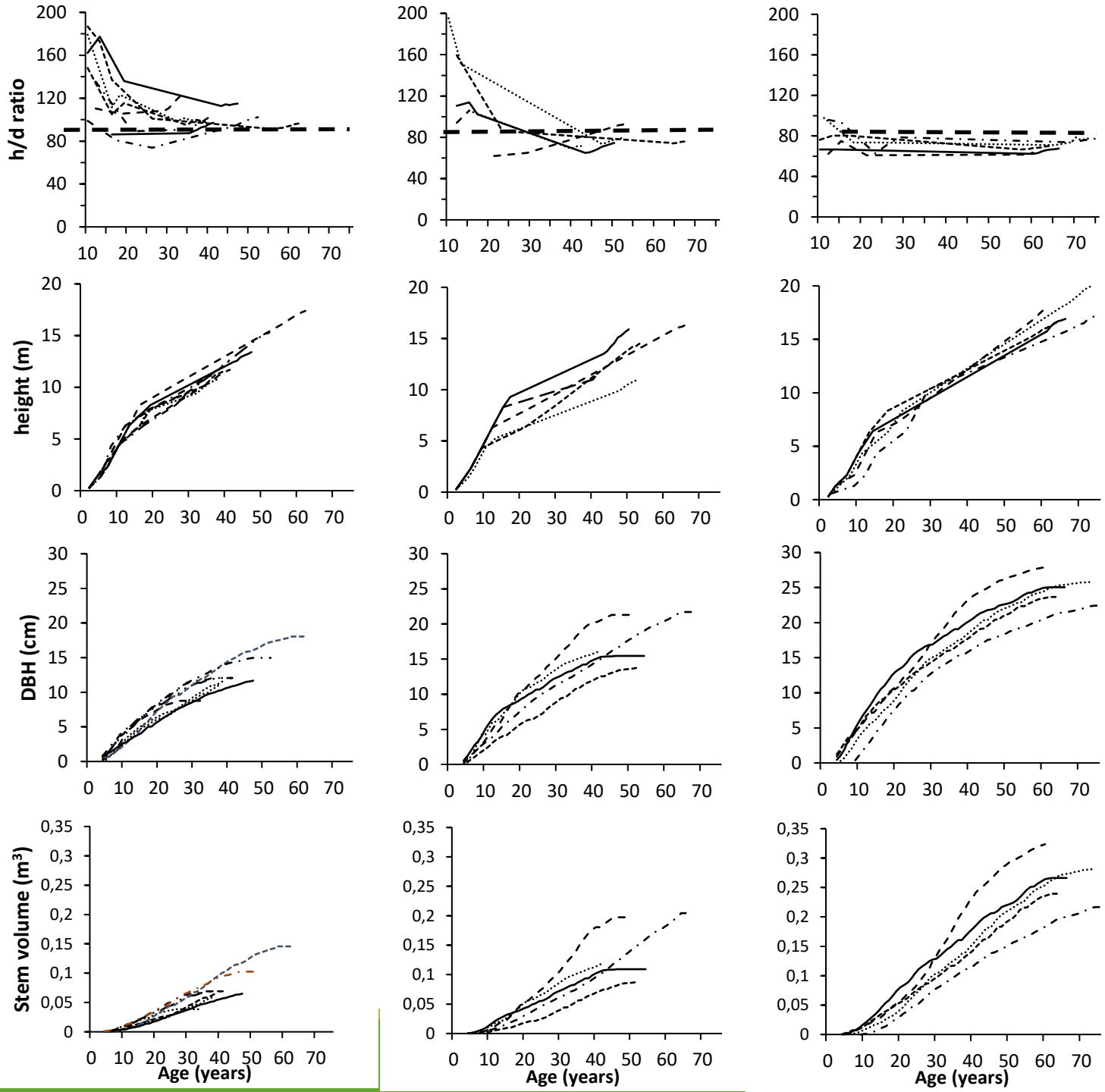
Variables	Young		Intermediate		Old	
	extract	remain	extract	remain	extract	remain
Number of stems/ha	3.078	3.200	697	1.483	450	707
Basal area [m²/ha]	18,3	37,8	11,0	45,9	13,6	40,8
Total volumen [m³ o.b./ha]	180	374	109	452	134	402
Volume of mature stems [m³ o.b./ha] (*)	5	18	20	154	48	201

* DBH ≥ 20 cm

Range of products	Young	Intermediate	Old
Firewood from the crowns and thin stems*	140	71	69
Badly formed stems	4	13	32
Quality wood	-	3	11 (5**)

* DBH < 20 cm; ** correspond to quality logs of fallen trees

Results of trunk analysis



Discussion and conclusions

- There is a potential to improve the production of height quality wood in the *L. hirsuta* stands in the valley of El Manso
- But… it is necessary to start the management in the young stage
- And this will be a slow and long process, because it is necessary first increase the vitality and stand stability against wind and wet snow in all stages

Recommendations for the young stands

- 200 crop trees should be selected and favoured trough thinning consequently until maturity
- About 150 crop trees should reach a DBH of 40 cm at the age of 70 years

Recommendations for intermediate and old stands

- Extraction of fallen and instable trees to capitalize on their wood and to favour the better ones
- Create space for natural regeneration or plantings by means of patchy clearances with
- *L. hirsuta* seedlings and other native species to replace stumps and improve the future stand quality
- Grazing must be stopped and stumps of cut trees must be killed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