

VIII POZNAŃSKIE FORUM

ZOOTECHNICZNO – WETERYNARYJNE

„Dobrostan zwierząt – współczesne wyzwania dla hodowców
i lekarzy weterynarii”

Poznań, 19 kwietnia 2012



Polskie Towarzystwo
Zootechniczne
im. Michała Oczapowskiego
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Powiatowy
Lekarz Weterynarii
w Poznaniu

zbyt dominującym. Ulepszone pastwiska są bardzo lubiane przez bydło i konieczna jest ich ochrona przed nadmiernym wypasem. Planowane jest szczegółowe przebadanie procesu pod kątem botanicznym i analitycznym.

Wnioski

Świnie rasy mangalica bardzo skutecznie niszczą murawę z bliźniczki psiej trawki i korzeni wrzosu. Po dwóch latach wypasania pierwotna murawa jest zniszczona i ziemia może być ponownie zasiana. Zawartość azotu w odchodach świń jest wystarczająca do stymulacji wzrostu mieszanki nasion i jednocześnie nie jest szkodliwa dla ekosystemu. Chronione gatunki storczyków ciągle są obecne na ogrodzonym terenie oraz na ulepszonych pastwiskach. Z nowymi pastwiskami należy postępować ostrożnie i chronić je przed nadmiernym wypasem. W celu śledzenia zmian w społeczności roślinnej i wartości pokarmowej konieczne są szczegółowe długotrwałe badania.

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Improvement of an Alpine pasture using Mangalica pigs an empirical study

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Summary

Pigs are known to degrade pastures by rooting and excessive nitrogen output. In this empirical study Mangalica sows and piglets are used to improve a degraded Alpine pasture. The pasture lies between 1000 and 1100 m above sea level on silicate ground and the soil varies between sandy and peaty. The original pasture was degraded by undergrazing and consisted mainly of mat grass (*Nardus stricta*) and heather (*Erica spp.*). As the region is a landscape protected area and of touristic value improvement by ploughing and re-sowing is forbidden. 3 Mangalica brood sows and their litters are fenced twice for a 3 month period in summer on an area of roughly 3000 m². Only whole barley is used as additional feed and as an incentive to rooting. After that the mat grass and heather roots are destroyed and the soil is re-sown with a locally adapted heavy duty grass mixture for livestock. In the first year after the re-sowing the area is mown, then submitted to controlled grazing and finally in the third year returned to normal grazing routine. The mat grass and heather are reduced to < 10 %. From the grass mixture red fescue (*Festuca rubra*) and white clover (*Trifolium repens*) have become firmly established. Both species are valuable fodder plants. Surprisingly the orchids *Dactylorhiza spp.* and *Orchis spp.* are still present even in the fenced areas. Detailed investigations over a longer period are necessary to evaluate the further development of the plant society on former pig pastures in the Alpine region.

Introduction

The destructive influence of feral and free ranging domestic pigs on vegetation is well known and documented (Siemann et al. 2009, Campbell and Long 2009). Uncontrolled release of pigs can destroy not only the forest but all vegetation in the region especially if pigs are an invasive species in the ecosystem. Usually pigs prefer a varied diet so the "main damage is not due to overgrazing but to digging up the soil" (Chimera et al. 1995). Some countries even have enacted laws forbidding damage to forests by free ranging domestic animals (Forstgesetz 1975).

Usually the focus for landscaping and vegetation management projects lies with grazing animals (Rook et al. 2004). Pigs are not often used in landscaping projects but some examples mostly in woodland management are known from the UK (CALU 2006, Small, 2011). The main idea is to destroy undergrowth preventing the natural regeneration and to open the ground for a more varied vegetation. Randall states that bracken (*Pteridium aquilinum*) is most popular with pigs and is destroyed thoroughly by rooting and weeding. There the pigs are used in open country (Isle of Islay, Scotland) to clear bracken roots. This ongoing project at Dunlossit estate, Islay, Scotland, makes use of several traditional British pig breeds. "Up to 4 years later the re-growth is much weaker and a different plant society has established itself." (Randall 2011). The Knepp Wildland Project (West Sussex, UK) uses Tamworth pigs to open the ground of a former intensively farmed area for a more varied plant society. Both UK projects try to conserve heathlands and report that heather (*Calluna spp.*) is able to survive the pig treatment. In Andalusia (Spain) the conservation of a whole landscape, the parkland Dehesa, depends inter alia on free-ranging Iberian pigs. Stocking density is very low about 1 pig per 2 ha. (Olea and San Miguel 2006). Birks stated in 2005 that the primeval forests of Europe probably consisted of a mosaic of glades, shrubs and high forest which was not purely created by the death of the giant trees but by grazing animals as well.

All authors propagating pigs for landscape management agree that measurements must be taken to prevent overuse of the land. Either the stocking density is very low or the time for grazing and rootling is limited (CALU 2006, Randall 2011, Small 2011). All projects mentioned use traditional and some use traditional and endangered breeds. They are hardier than modern hybrid pigs and most of them are pigmented and therefore naturally resistant to sunburn. The traditional breeds require no high quality feed and are able to cope with bad weather.

Material and Method

Location

The Seewaldsee Alm is an Alpine pasture of 27 ha in the Federal County Salzburg. It lies between 1000 and 1100 m a.s.l. and is slightly bowl-shaped. The ground is silicate and almost lime-free with sandy to peaty soil. The yearly precipitation is about 1100 mm. The lower areas of the Alm are dominated by moor and wetland with a peaty lake of ~ 3,5 ha at the lowest point. The lake has no feeding watercourse but a natural drain. The whole area is under nature protection (protected landscape, moor, wetland). Ploughing and re-sowing is not allowed. Usually the pasture is used from end of May to middle to end of September for cattle, horses and goats. Due to overgrazing by cattle and sheep in the past the sward in the sandy areas consists mainly of mat grass (*Nardus stricta*) and heather (*Calluna vulgaris*). Plenty of protected orchids (*Dactylorhiza spp.* and *Orchis spp.*) occur in these areas but otherwise the sward is relatively poor in biodiversity. For this study only sandy areas of the pasture with moderate slope are used.

Pigs

All projects mentioned above use traditional and some use traditional and endangered pig breeds. They are regarded to be more robust than modern hybrid pigs and most of them are pigmented and therefore naturally resistant to sunburn. The traditional breeds require no high quality feed are good foragers and are able to cope with harsh weather with periods of high rainfall and moderate temperatures. The Mangalica pig was chosen for two reasons: It has a dense coat of hair protecting it from the harsh mountain climate and it is a typical pasture pig bred to forage for itself and needing only little additional feed (Radnóczy 2003). All three types of Mangalica are used the swallow-bellied being the most numerous type in Austria.

Improvement plan (Fig. 1)

An area of about 3000 m² is fenced with wire net and electric (solar) fencing. A mobile hut lined with straw for shelter in bad weather is provided. The enclosure has access to a small brook for drinking and wallowing in mud. 3 pregnant Mangalica sows close to farrowing date are put on this pasture at the end of May. They farrow on the hut and raise their piglets for about 3 months. Additional feeding is used only sparingly and mostly to encourage rootling (whole barley grains). At the end of August the pigs are removed and the enclosure is left standing until the next spring when the treatment is repeated. After the second summer of pig grazing the area is re-sown with a locally adapted heavy duty grass mixture (ÖAG). The area is still fenced and only one cut of hay or 1 week of controlled grazing is done in the next summer (year 4). From the 5th year onwards the pasture is not fenced and used as an improved mountain pasture.

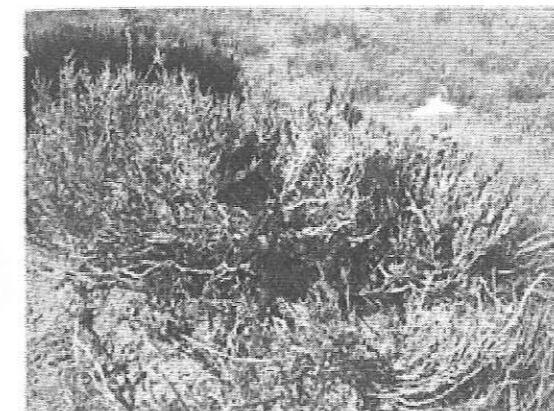
Fig. 1 Improvement plan

year 1	year 2	autumn	year 3	year 4	year 5...
pig pasture 3 months	pig pasture 3 months	re-sowing	1 cut hay or controlled grazing	controlled grazing (cattle)	improved Alpine pasture

Each year a few days before the pigs return the progress is documented in photographs. This year the documentation took place on 26th May.

Preliminary results and discussion

According to Rook et al. (2004) mat grass and heather are grazed by cattle only reluctantly and only when the shoots are young. Horses avoid the plant. The problem with mat grass is not only the low feeding value but the very dense mattress of the sward preventing germination of other plants.



Contrarily to the British projects (Randall 2011, Small 2011) this study aims at the destruction of mat grass as well as heather roots to open the ground for an improved sward by re-sowing.

After the first year of grazing the mat grass is almost destroyed (Fig. 2) and a few tufts of heather are still left. The naked soil is partly covered with annual meadow grass (*Poa annua*). The orchids are resistant to the pig treatment and are still flowering.



The situation after re-sowing in autumn 2010 is shown in Fig. 3. The blue ball pen almost vanishes in the grass. On the poor soil the pig treatment provides not only open ground but fertilisation as well. Gon III (2006) mentions the damaging effect of the nitrogen output in sensitive environments. Krautzer (2011) recommends a moderate dose of fertilizer for newly sown Alpine pastures but all fertilization save manure is forbidden in protected areas. Here the nitrogen provided by the pigs seems to be enough to give the seeds a good start without damaging the ecosystem.



Fig. 4 Re-sown in 2005

Up to 6 years after the end of pig pasturing no notable re-growth of mat grass and heather has taken place (less than 10% of sward). From the seed mixture Red Fescue (*Festuca rubra*) and White Clover (*Trifolium repens*) have become firmly established. Narrowleaf plantain (*Plantago lanceolata*) is invading the newly sown areas and might become too dominant in the future. The improved areas are favoured by cattle and have to be protected preventing overgrazing. A detailed botanical and analytical follow up of the process is planned.

Conclusion

Mangalica pigs destroy swards of mat grass and heather roots very effectively. After two years of grazing the original sward is destroyed and the ground can be re-sown. The nitrogen output of the pig manure is sufficient to stimulate the growth of the seed mixture without damaging the ecosystem. The protected orchid species are still present in the fenced area and in the improved areas as well. The new pasture has to be managed carefully to prevent overgrazing. To follow up the changes in the plant society and feeding value detailed investigations over a longer period are necessary.

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