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Evaluation of forest damage derived from the rearing of Apulo-Calabrese pig

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Abstract. The Apulo-Calabrese is one of the five Italian native pig breeds, officially recognized. At the moment it is reared in 35 farms, 29 of them are localised in the Calabria region. The aim of this work was to assess animal management with particular attention to the forest grazing. The survey involved 20 farms and in 4 of them the forest damages in two seasons (summer and autumn) were evaluated. 80% of farms pastured forest all the year, 75% supplied concentrate to the animals irrespectively of pasture. 67% of farms pastured all the productive categories. The damage to trees from barking and root uncovering was higher in summer and decreased with the increased distance from the shelters. The slope of the soil increased the damage by uncovering (0.2% per degree). The most uncovered tree species were chestnut and phillyrea, while these most barked were holm, oak and phillyrea. Soil and litter were heavily damaged near the shelters (30.29% and 52.47%, respectively). Soil trampling and excavation damage were found in 31% and 36.5% of the experimental areas, respectively. Finally, the greatest damage was observed in the farms with the highest animal loading.

Keywords. Local pig – Apulo-Calabrese breed – Pasture in forest – Forest damage.

Evaluation des dégâts forestiers causés par les troupeaux de porcs de race Apulo-Calabrese

Résumé. La race porcine Apulo-Calabrese est une des cinq races porcines indigènes italiennes officiellement reconnues, et actuellement élevée dans 35 exploitations, dont 29 dans la région de Calabre. Le présent document vise à évaluer la gestion des animaux en mettant l'accent sur le pâturage dans la forêt. L'enquête a porté sur 20 exploitations et 4 d'entre elles ont évalué les dégâts causés au bois à deux saisons (été et automne). 80% des exploitations font brouter la forêt tout au long de l'année; de toute façon 75% distribuent du concentré. 67% des exploitations agricoles font pâturer toutes les catégories d'animaux. Les dégâts causés par l'écorçage et par le creusement autour des racines des plantes ligneuses sont plus élevés en été et diminuent avec la distance de l'abri. La pente du sol augmente les dégâts du creusement (0,2% par degré). Les arbres les plus écorcés sont: châtaignier et phillyrea; les plus creusés: chêne vert et phillyrea. Les sols et la litière sont fortement endommagés près des abris (30,29 et 52,47%). Le piétinage du sol a été observé dans 31% des cas et le creusement du sol dans 36,5% des cas. Les dégâts les plus importants ont été observés avec le chargement animal plus élevé.

Mots-clés. Porc rustique – Race Apulo-Calabrese – Pâturage dans la forêt – Dégâts aux forêts.

I – Introduction

In recent decades, the scientific community and institutions have recognized the need to preserve animal germoplasm to limit the decline in genetic variability caused by the selection and the use of few "improved" breeds. With this perspective it could be inserted the recovery and preservation, carried out in Calabria, of the Apulo-Calabrese breed. In farms that raise this breed, grazing in the forest is often implemented. This practice should be done with extreme caution because the pigs, given their ethology, can alter the soil as well as damage the plant component and affect the hydro geological function (Grifoni and Gonnelli, 2009). The purpose of this study was to describe farms that rear Apulo-Calabrese pigs in province of Cosenza (Calabria), and to estimate the impact of grazing on the forest.

II – Materials and methods

Description of herds: The survey involved 20 farms. The information, collected on special sheets, were: farm size, land use, herd consistency and feeding management. Averages, ds and frequency of classes were calculated.

Impact on forest: The measurements to assess the entity of the impact on the forest were conducted in four herds into two periods of the year, summer and autumn. The method used for the assessment of damages was essentially that proposed by Grifoni *et al.* (2007). For all parcels, slope, distance from the shelter and loading (number of animals / ha) were also detected. In this study only some of the parameters of damage are analyzed: uncovering of the roots and barking of woody plants, litter movement, alteration in the humus layer and soil trampling and excavation. Data on damages were submitted to analysis of covariance (SAS, 2003), using, as discrete factors, season (summer, autumn), distance from shelter (four classes: in shelter, near, intermediate, distant), tree species (*Quercus ilex*, *Quercus cerris*, *Quercus pubescens*, *Castanea sativa*, *Phillyrea latifolia*) and, as continuous factors, animal loading and ground slope.

III – Results

Description of herds: The farms are ranked by total surface size and Table 1 shows the descriptive statistics.

Table 1. Means of farm features according to dimensional classes

	Farm surface		
	< 20 ha	21- 100 ha	> 100 ha
Number of farms	13	6	1
Total farm surface (ha)	6.9	35.2	420
Farm surface for pig (%)	62	34	5
Number of pigs	17.2	60.5	42
Pigs/wood surface (n/ha)	10.9	11.4	2.1

Most farms (65%) are small (<20 ha), with lower extension than those who raise other rustic Italian breeds, such as Cinta Senese (Bonanzinga and Nardi, 2007) and Nero Siciliano (Costanza *et al.*, 1990), and this fact is confirmed by a recent survey by Nicolosi *et al.* (2009). Only one farm has surface larger than 100 ha. The stratification by size shows that midsize farms have, on average, the highest number of animals.

The number of animals reared per farm (Table 2) shows an average of 31.45, with wide variability (± 45.39). Only one herd has no breeding animals and it raises exclusively for fattening; other herds raise 14 sows and two boars, on average. The values are higher than those observed by D'Ancona (2001) for Nero Siciliano (8.1 sows and 1.5 boars) and Bonanzinga and Nardi (2007) for Cinta Senese (9.5 sows and 1.6 boars).

Table 2. Average consistency of farms according the animal category

	Sows	Boars	Gilts	Small boars	Total
Average	14.35	2.3	8.35	5.95	31.45
S.d.	27.43	3.26	11.81	9.62	45.39

As feeding management is concerned, the 80% of farms holds wood areas where grazing takes place throughout the year while the 20% suspends the pasture during the summer (June-September). No farm has meadows and pastures, unlike the situation of breeding of Cinta Senese in Tuscany (Giulioti and Ferrini, 2004).

In 67% of farms all categories of pigs are sent to pasture while, in the other farms, the pasture is dedicated exclusively to the breeding animals. Regarding the animal loading, defined as the number of animals per hectare of grazed area, it is resulted an average of 7.7 heads with a large variability (SD \pm 5.9). However, in every herd feeding supplement is adopted using either commercial mixtures, or concentrates of farm origin, regardless of grazing; in fact the feed administration occurs throughout all the year in 75% of cases (daily dose of 2.5% of PV), while the remaining 25% of farmers suspends the feeding in autumn, to coincide with the fall of chestnuts and acorns.

Impact on forest: Table 3 shows that in summer the percentage of barked plants was much greater than in the autumn and this may be attributable to the presence, in the autumn of acorn. For uncovering of roots differences do not reach statistical significance.

Table 3. Effect of season and distance from shelter on trees damage (estimated to average loading of 2.92 pig/ha and ground slope of 28.84%)

	Season		Distance			
	E	A	On shelter	Near	Intermediate	Distant
% Uncovered roots	25.95	18.27	63.22 a	17.30 b	5.80 c	2.13 c
% Barked plants	26.10 a	9.14 b	49.93 a	15.10 b	3.60 c	1.85 c

Different letters for P<0.05.

The two types of damage decreased significantly with increasing of distance from the point of shelter. Finally, the percentage of uncovered roots was found to be influenced by the slope of the soil (+ 0.20 percentage points for each degree of slope, data not tabulated).

The two types of damage were analyzed also for the effect of the different tree species (Table 4). Table shows that for uncovering there were not significant differences, although *Phillyrea latifolia* and *Castanea sativa* seemed the most damaged. For barking, on the contrary, *Quercus ilex* and *Phillyrea latifolia* were more damaged while *Quercus pubescens* (P<0.05) was the species that suffered less damage.

Alteration of litter and humus (Table 5) was very influenced by the distance from the animal shelter, because the damage decreased progressively with the distance. The humus was also damaged by the increase of loading (P<0.05) but not by the ground slope (data not tabulated). The soil trampling (data not tabulated) were detected in 31% of cases and were evaluated for type light, medium and high in 48, 9 and 43% of cases, respectively. The damage from excavation were observed in 36.5% of cases, with low entity in 18.5%, medium in 48% and strong in 33.5% of cases.

Table 4. Effect of tree species on trees damage (estimated to average loading of 2.92 pig/ha and ground slope of 28.84%)

	<i>Castanea sativa</i>	<i>Quercus cerris</i>	<i>Quercus pubescens</i>	<i>Quercus ilex</i>	<i>Phillyrea latifolia</i>	DSR
%Uncovered roots	25.38	18.44	20.65	19.32	24.60	12.88
% Barked plants	15.90	19.20	13.98 a	27.83 b	26.92 b	13.25

Different letters for P<0.05

Table 5. Effect of season and distance from shelter on the damage on litter and humus

Category	Season		Distance from shelter				
	E	A	On shelter	Near	Intermediate	Distant	DSR
% Altered litter	61.20	54.86	96.84 a	52.47 b	48.10 cb	34.73 c	26.56
% Altered humus	38.10	34.11	84.00 a	30.29 b	15.06 b	15.10 b	26.80

Different letters for $P < 0.05$.

IV – Conclusions

The survey shows that the breeding of Apulo-Calabrese pig is implemented mainly in small farm and rarely ignores the presence of the forest, according to the vocation of the breed to be reared outdoors. The survey shows, however, that the grazing is little managed and pigs remain in woods throughout the year, in almost all cases. The loadings are high and food requirements of animals are supported by high dose of concentrates, irrespective from the pasture. The relation between loading and damages must be explored. Looking at the damage that Apulo-Calabrese pig determined both on the forest plants and on the soil, it appears that the impact was substantial, especially in summer and in the proximity of shelters and it became very serious within the shelter. All tree species suffered barking and root uncovering, the latter increasing with ground slope. This suggests the need to organize the shelters outside the forest. In conclusion, in our point of view, to avoid waste, reduce environmental impact and ensure animal welfare and product quality it must be implemented a system that: (i) turns grazing surface; (ii) limits grazing in the forest to the period in which it provides food (acorn and chestnut); (iii) provides other types of pasture, as meadows; (iv) administrates diet according to the needs of animals and the availability of pasture resources.

References

- Bonanzinga M. and Nardi G., 2007.**, Cinta Senese, il rischio estinzione non esiste più. In: *Riv. di Suinicoltura*, 9: 26-31.
- Costanza M., De Iungo P., Farina A. and Gemignani G., 1990.** Possibilità di recupero e di valorizzazione delle risorse forestali. In *Sistemi agricoli marginali – Sicilia*. Ed. AA.VV., Palermo 111-168.
- D'ancona R., 2001.** Nero dei Nebrodi: suino da recuperare. In: *Rivista di Suinicoltura*, 9: 71-75.
- Giuliotto L., and Ferrini G., 2004.** Cinta Senese, crescono gli allevamenti in Toscana. In: *Rivista di Suinicoltura* 4: 109-112.
- Grifoni F., Gonnelli V., Fabbio G. and Benvenuti C., 2007.** Rearing of Cinta Senese pigs in oak and chestnutstands in central Tuscany – Proposal of a field survey method to estimate type and intensity of the damage. In: *Options Méditerranéennes, Series A* 76: 119-122.
- Grifoni F. and Gonnelli V., 2009.** Alterazioni forestali conseguenti al pascolamento. In: *Il bosco e l'allevamento della razza Cinta Senese*. Ed. G. Fabbio – A.R.S.I.A.
- Nicolosi A., Racinaro L., Tromby F., Palermo R.C. and Micari P., 2009.** The breeding of the Apulo-calabrian swine in Calabria: current technical and economical analysis and prospect of development. In: *Italian J. Anim. Sci.* 8. suppl. 2: 571.