FREE RANGE RABBIT BREEDING SYSTEM: NEW TECHNOLOGIES

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INTRODUCTION

Free range rabbit breeding (warren) is still rather diffused, at least in Europe, both for hunting (wide areas) and for commercial or autoconsumption purposes (mainly small breedings). In spite of the fact that warren breeding systems can be useful to exploit many types of marginal stony, steep and bushy land, at low investment and management costs and part-time work, no research has ever been specifically and systematically devoted to improve this kind of breeding.

Nevertheless some contrivances, useful to put rabbit-warren breeding under the control of the breeder, can be produced and utilized in the routine work (Finzi, 1986).

To study the possibility of development of this peculiar breeding system with commercial purposes, a research has been carried out to solve different kinds of problems. These are: 1) warren dimensions and subdivision; 2) fencing and defence from preyers; 3) capture systems and control of the animals; 4) suitable resting shelter 5) nests protected from climatic agents; 6) grass or integrate feeding; 7) males utilization; 8) prophylaxis and therapy; 9) light program. The points 1, 2, 3, 4, 7 are took into consideration in the present paper.

MATERIALS AND METHODS

Three different breeding models were studied. The first one is a simulation of a traditional rabbit-warren (Primitive) where only a capture contrivance was introduced to check the animals according to the management and experimental needs; the second one is an Improved system where all the experimental contrivances were utilized; the third is a Commercial one, in which were introduced only three contrivances (capture system, resting shelter, concentrates available) chosen by the breeder according to his own criteria. Where no differences are specified it means that the breeding characteristics are the same for the different models.

All the models were based on a colony breeding with five does. The buck was also present except in the Improved system where the male were bred in a cage near the warren.

The fencing method utilized is yet standardized and its scheme is reported in figure 1. A 170 cm high electro-plated net was used; the upper curved part avoids the entry of climbing preyers; the underground part is sufficiently deep (cm 45) to avoid rabbits to escape and the barbed wire, just below the ground level in the outside part, prevents ground preyers to dig. Internal subdivisions can be made with a thinner net, 60 cm high and 40 cm underground deep.

Since the aim of the research is to develope commercial warrens, the breeding area was limited. In the Primitive system the area was 10 m^2/doe. For sanitary reasons and to exploit better the pasture, the animals were moved, each six months, to an identical surface, so
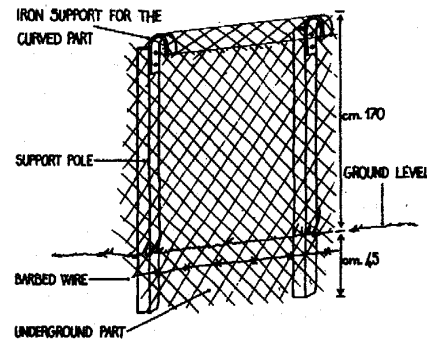

Fig. 1 - Scheme of fencing system for rabbit-warrens.

that the total area devoted to reproduction was 20 m^2/doe, as to say 100 m^2 per breeding colony. The dimensions of the Improved system were exactly the half of the Primitive one, while the Commercial system had the same total dimensions of the Primitive one without internal subdivision, since rotation was not foreseen.

To avoid the problem of burrows dug everywhere and subjected to be drawn by the rain during wintertime, mainly in flat land, a resting place was built according to the scheme illustrated in figure 2. The shelter was formed by hay-bales laid on a structure of wooden poles, which were set horizontally (eventually leaning on bricks) in order to form a platform about 3 square meters wide, and about 80 centimeters high. The structure was covered by plastic or corrugated iron sheets. The covering had the function to protect the area from the rain and the poles had the function to carry the structure when the rabbits dug the common hall and the burrows under it.

To keep the animals under control a rabbit-warren, devoted to commercial purposes, must be provided of a capture contrivance. This was set preparing a feeding and drinking area, about 1.5 m^2 wide. The fence was provided of a small swinging door (figure 3), through which the animals could enter the area. A light protruding metal bar or a stick, when applied in the inside part of the swinging door, permits the animals to enter but not to get out again, so that, when applied in the late afternoon, all the animals remain trapped and can be easely caught the following morning.

This is the simplest and most efficient system which has been produced, and it was utilized every 15 days in the Improved model to select the animals for fattening and culling, to mate the does in the cages of the males and to make the diagnosis of pregnancy, and therapeutic or prophylactic treatments when necessary.

Catching of the animals was also done every 15 days in the Primitive model for experimental reasons, but mainly to check the pregnant does. In the Commercial model the capture contrivance was utilized mainly to allow the withdrawal of the subjects to be sold.
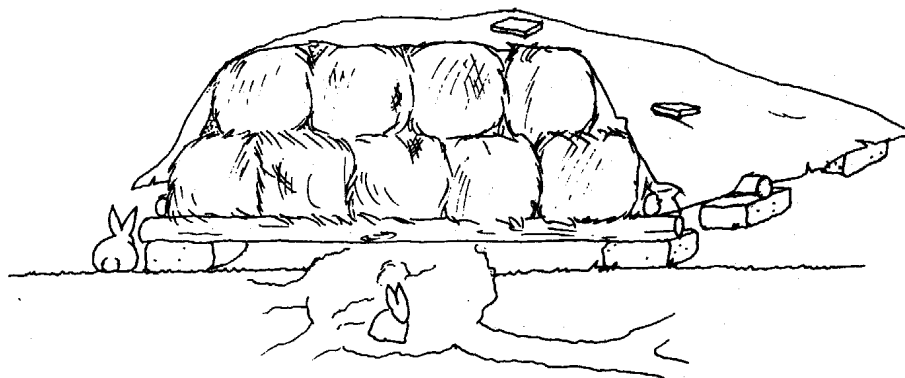
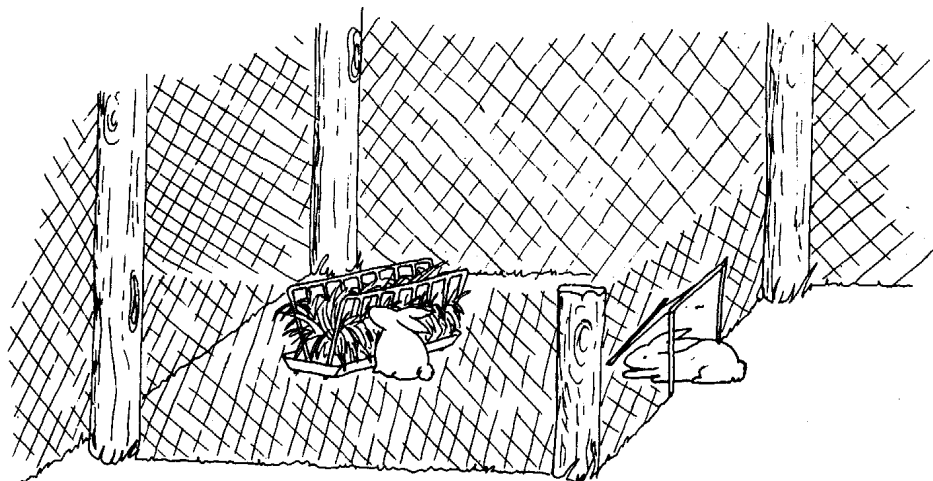Fig.2 - Basic scheme of the coliny resting shelter.

Fig.3 - Scheme of feeding area with the capture contrivance.

During the trial the animals fed on pasture. Grazing was reduced in the Improved system due to the more limited area, but the animals received also a common commercial pellet (17% protein; 16% fibre) ad libitum in the capture area. In the Primitive system the animals received daily an integration of polyphyte grass, and vegetable wastes from the general market were given, in a considerable amount once a week, togheter with dry bread in the Commercial system.

The only prophylactic treatments adopted were against ecto and endo-parasitosis and coccidiosis. The treatment against the latter was not utilized in the Primitive system, and its necessity has not yet been put in evidence after six months.

The main experimental differences in technology and management adopted in the three different rabbit-warren models are reported in table 1.

Table 1 - Characteristics of the adopted warren breeding techniques.

MODEL	Resting shelter	Capture system	Explorable nests	Checking of animals	Concentrates available	Mating in cage
PRIMITIVE	-	+	-	+[2]	-	-
IMPROVED	+	+	+	+[1]	+	+
COMMERCIAL	+	+	-	+[2]	+	-

1) Checking of the animals every two weeks; 2) Checking monthly or when necessary;

RESULTS AND DISCUSSION

The fencing and subdivision system (figure 1) gave no problems during two years and no needs of further improving were put in evidence. At least the troubles given by dogs and foxes in the first year were not repeated.

To avoid moving the does when they still had unweaned litters which should die in the burrows, rotation of pasture required a peculiar buck management. To reduce the lost of productivity the best result was obtained withdrawing the buck from the seventh to the third week before rotation. In the Improved system moving of the does gave no problems since matings were controlled.

The general scheme of the resting shelter (figure 2) was subjected to many modifications in shape, height, and structure, but always the rabbits preferred this place to dig inside and down it for resting, to shelter from rain and sun, and sometimes also for nesting.

A three years experience showed that the resting shelter should be always foreseen when setting a rabbit-warren. The main results were a decrease in adults and litter mortality due to rains, and a very much reduced digging activity outside the shelter. On the contrary the shape and structure were unimportant, so that the shelter can be made according to economy and easyness of building.

The capture contrivance (figure 3) gave no problems but it had to be built very strongly since the animals struggle against it when they are caught. The best system to catch the animals was to use a net with a long handle.

The running of the experience showed that also a breeding performed with a Primitive system, to exploit a marginal land, should be provided with a capture contrivance, as the Commercial model, to allow the withdrawal of the subjects to be sold.

Warren productivity was smaller than in common rabbitries both in number and in growth rate. The latter is illustrated in figure 4. As it can be seen, at weaning time, the average live weight, calculated over
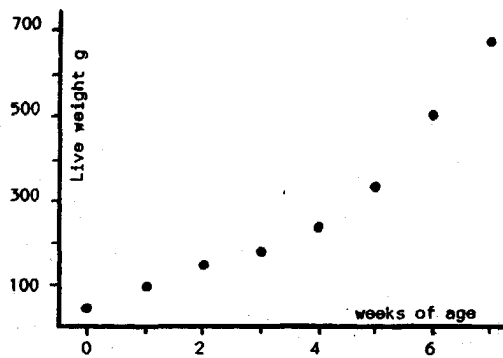

Fig. 4 --Live body weight trend of young rabbits in the Improved warren.

48 ·subjects from 8 litters, was only 235 grams. Consequently it was estabilshed to calculate the productivity (table 2) at seven weeks of age, when the young rabbits were withdrawn from the warren, weighing nearly 700 g, to be subjected to a fattening period in cage.

Table 2 - Productivity in the different warren rabbit breeding systems.

WARREN SYSTEM	TEST PERIOD	PRODUCTION PER YEAR[1]		
	months	No./doe	No./10 m^2	No./ha[2]
PRIMITIVE	6	7.0	3.5	1150
IMPROVED	15	12.8	12.8	4220
COMMERCIAL	17	16.6	8.3	2740

1) At seven weeks of age; 2) Supposing to utilize for reproduction
   only 1/3 of the total surface.

Of course, since the animals came from free range breeding, at an advanced age and weight stage, the subsequent mortality was practically null, and the production at seven weeks, reported in the table, was practically equivalent to the number of sold.

The comparison among the systems shows that the productivity of only 7 rabbits per doe per year can be doubled when some technical contrivances are adopted. Obviously the increasing of productivity is more evident, mainly in the Improved system, if referred to the utilized surface. If referred to one hectare an hypothetical production of 4200 rabbits, which can be obtained with the Improved breeding model, and the 2700 ones, which can be produced at a lower feed cost and from time to time work in the Commercial model, appears of relevant economic interest. Has to be underlined also the importance of the Primitive system, capable of producing 1.100 rabbits per hectare, when marginal land must be exploited.

CONCLUSIONS

The experience carried out to improve rabbit-warrens, to exploit marginal land with commercial purposes, has shown that the many contrivances studied appear to be useful, and that the productivity of the system can be considerably increased.

REFERENCES

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SUMMARY

As a contribution to a better exploiting of marginal land, the Authors describe some technological contrivances able to improve rabbit-warren breeding system. These are mainly: fencing and defence from preyers; capture system and control of the animals; suitable resting shelters; subdivision of the breeding area and rotation of pasture.

Some of these contrivances were studied for a three years period, and reproduction data were recorded for many months in three different types of rabbit-warrens. One of them was a Primitive model where only a feeding and capture area was introduced. This was compared with an Improved system where all the studied contrivances were adopted, and with a Commercial one in which three contrivances were chosen by the breeder.

The experimented contrivances proved to be functional, and the breeding results indicated that it is possible to rise the average production from 7 weaned per doe per year in the Primitive rabbit-warren, to 13-16 weaned in the two breedings where new technologies had been introduced.

Key words: rabbit, warren, breeding, free range.

RIASSUNTO

Al fine di contribuire ad un migliore sfruttamento delle terre marginali, gli Autori descrivono alcuni accorgimenti tecnici in grado di migliorare l'allevamento libero del coniglio in garenna. Tali accorgimenti riguardano: le recinzioni e la difesa dai predatori; il sistema di cattura e di controllo degli animali; la zona di riposo e di ricovero; la suddivisione dell'area di allevamento e la rotazione del pascolo.

Le versioni definitive di questi accorgimenti sono il risultato di studi effettuati per un triennio, e sembrano rispondere allo scopo senza necessità di ulteriori miglioramenti.

Sono stati comparati tre sistemi di allevamento in garenna. Il primo consisteva in un modello Primitivo dotato soltanto del meccanismo di cattura per il controllo degli animali. Il secondo era un modello Migliorato dotato di tutti gli accorgimenti tecnici studiati, mentre il terzo era un modello Commerciale dotato soltanto di tre accorgimenti scelti dall'allevatore.

I risultati indicano che è possibile migliorare la produzione da 7 svezzati per fattrice per anno nel modello Primitivo, a 13-16 svezzati negli altri due modelli tecnologicamente migliorati.

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SUMMARY

The Authors describe some technological contrivances which contribute to perform a more rational rabbit-warren breeding system.

Rabbit feeding and capture systems, and controllable nests are described, and their advantages on management are analyzed.

The trial was carried out during a three years period and reproductive traits and growth rate until weaning were recorded. The warren breeding linked pathologies and the possibility to control them was taken into consideration.

The results indicate that it is possible to rise the average production from 9 weaned per doe per year in the not controlled rabbit-warrens, to 14-16 weaned per doe per year in two breedings where technologies had been improved.

This system can be developed in turf with trees, but it is particularly studied to exploit marginal land (also stony or steep and bushy) at a low investment cost and at a part-time work management.

SOMMARIO

Gli Autori descrivono alcuni accorgimenti tecnologici che contribuiscono a rendere più razionale l'allevamento del coniglio a terra.

Vengono inoltre descritti i sistemi di alimentazione e cattura ed i nidi esplorabili, ed analizzati gli effetti di questi sulla gestione dell'allevamento.

Le prove sono state effettuate per un periodo di tre anni durante il quale sono stati controllati gli aspetti riproduttivi e gli accrescimenti fino allo svezzamento. Sono state inoltre considerate le più comuni malattie legate all'allevamento a terra, ed il modo di controllarle.

I risultati ottenuti indicano che è possibile aumentare la produzione media, da 9 coniglietti svezzati per fattrice per anno in una garenna non controllata, a 14-16 svezzati per fattrice per anno in due modelli dove erano stati apportati dei miglioramenti tecnologici.

Questo sistema di allevamento può essere sviluppato in terreni erbosi scarsamente alberati, ma è particolarmente studiato per utilizzare terreni marginali (anche sassosi, scoscesi o cespugliosi) con bassi investimenti e con gestione a tempo parziale.

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