

EXPERIMENTAL FARM IN ZEGVELD
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23.1 Introduction

The "Foundation Regional Research Centre for cattle husbandry in the Western pasture district" is operating the experimental farm in Zegveld. The purpose of this foundation is the promotion and development of the cattle husbandry in this area. The foundation tries to attain this goal by executing practical research concerning cattle husbandry and by propagating the results.

Originally the experimental farm was smaller (20 ha) and located elsewhere. After a reallocation in 1966 the farm was resettled and enlarged with 10 ha, today the experimental farm is 49 ha.

23.2 Data on the farm

Farm buildings

The cowhouse has been renovated and expanded in 1978. The measurements of this building are 51 x 34 m and the building is based on 476 piles with a length of 11 à 12 m. This building consists of a cubicle house with 70 lying boxes in two rows, a lock-stall with 30 cow-catcher-boxes used for individual feeding tests, a two-row open-air-stall for 30 cows and 30 yearlings, a disease-stall with two places, a calving pen for five cows, a walk-through system milking parlour with 2 x 5 places and 10 milking units. Beside the milking parlour is the milkroom with a

milktank for 8000 kg milk. The open-air-stall has a mixed manure pit below-floor with a storage facility of 450 m³, sufficient for more than two months.

The barn, built in 1966 with a surface of 450 m², includes an equipment-shed, a hay stack and an open-air calfpen. There is a concrete clamp silo (8 x 30 x 1.20 m) and a concrete silage-slab (12 x 30 m) for Dutch mows, both resting on 176 piles.

Grassland

The grassland area is 49 ha. Behind the farm buildings 44 ha grassland is situated in one block and the remaining 5 ha is situated at about 500 m distance from the farm. Most of the plots have a good accessibility by means of a concrete farmroad. The soil is a clayey wood peat, about 7 m thick, overlying Pleistocene sand.

Some analytical data:

	Average	Variation
pH-KCl	5.1	4.8- 5.3
% clay	21	14 -34
% organic matter	45	35 -57

Drainage experiments

These experiments are described in Chapter 9.2, and the consequences of the different drainage depths are discussed at length in Chapter 9.

Livestock

The Friesian-Dutch black-and-white herd in mean consists of 100 dairy cows, 25 yearlings and 30 calves.

The average milk yield is 5500 kg per head.

Nitrogen application

The next sketch is used for the nitrogen application:

Nitrogen gift in kg N per ha.

Apply to	1st		2nd		3rd	4th/5th	6th cut
	C	G*	C	G	C and G	C and G	C and G
High ditch water level (shallowly drained)	90	65	65	45	45	40	26
Low ditch water level (deeply drained)	70	50	50	26	26	26	26

C = cutting

G = grazing

* For the first cut 50% of this area gets a lower gift (45 and 35 kg respectively) to get a more continuous supply of grass.

Grazing

It is all permanent grassland. The milking stock is put to grass at about 1700 kg dry matter per ha. The length of the grass is then about 8 à 10 cm. The cows are being housed at night. The calves that graze for the first time are put on aftermath to prevent gastro-intestinal nematode and lungworm contamination.

Supplementary feeding. In addition to 8 à 9 hours of grazing the following amount of concentrates is being given:

Milk production in kg/cow	34	32	30	28	26	24	22	20	18	16	14
kg concentrates per cow	7	6	5	4	3	2	1	1	1	1	1
kg concentrates per heifer					5	4	3	2	1	1	1

Winning of roughage

In spring about 3 weeks after the cows have been put to grass, the winning of roughage starts. The first cut extends to about 60% of the total

farm area and is being harvested within three weeks. This means that 20% of the total farm area (= ca. 10 ha) is cut weekly. In preference this cutting takes place on Mondays. The duration of the wilting period should not exceed 5 days. If weather conditions are still bad after a wilting period of 3 to 4 days, salt is being added as a preserver. The salt (300-500 kg per ha) is spread by a fertilizer distributor on the dew-wet crop before this is windrowed. After this the grass is put into silage.

Farm experiments

- Sodseeding of bad, old grassland
- Application of Roundup (a herbicide) before sodseeding
- Consequence of not cutting after grazing periods
- Loss of harvest under farming conditions
- Sprinkling fluid slurry
- Storage of wilted silage
- Consolidation of farmroads
- Subsidence of surface level of deeply and shallowly drained peat soil (see Chapter 9)
- Housing of calves in open stalls
- Housing of young stock on dung grid and in cubicles
- Influence of concentrates and straw on the fat content of the milk
- Detergent tests and mats used in cubicles.

Economic results of the Experimental Farm

Financial year 1 May - 30 April	1977/1978	1978/1979	1979/1980	1980/1981
Ha. grassland	49	49	49	49
Mowing percentage	130	130	110	170
Average number of calves	30	30	34	32
Average number of yearlings	31	30	30	32
Average number of dairy cows	100	101	102	103
Average number of livestock units	124	126	127	129
Dairy cows per ha	2.0	2.0	2.1	2.1
Livestock units per ha	2.5	2.6	2.6	2.6
Total milk production	543 800	569 800	561 300	601 800
Kg milk per cow	5 450	5 620	5 520	5 810
Fat percentage	3.94	4.01	4.06	4.04
Protein percentage	3.35	3.40	3.36	3.34
Winter milk percentage	51	50	48	48
Milk price	61.75	61.85	64.10	63.50
IN GUILDERS PER MILK COW				
Milk yield	3 365	3 476	3 540	3 685
Sales and increment	588	566	606	618
Total proceeds	3 953	4 042	4 146	4 303
Concentrates	897	833	1 270	992
Milk products	29	39	32	35
Roughage	56	58	194	94
Total feed costs	982	930	1 496	1 121
Balance:				
Proceeds minus feed costs	2 971	3 112	2 650	3 182
Ditto per ha grassland	6 050	6 440	5 500	6 700
Kg of concentrates per cow	2 160	2 240	2 980	2 520
FERTILIZATION				
Kg N per ha	220	282	252	290
Kg P ₂ O ₅ per ha	28	32	20	27
Kg K ₂ O per ha	43	96	29	45

RESEARCH STATION IN BOSKOOOP
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Boskoop is the most important nursery-centre of The Netherlands, ca. 1000 nurseries with a total area of 900 ha, concentrated in Boskoop and the surrounding villages.

The topsoil is composed of about equal parts of humus, sand and clay. The pH varies between 4.5 and 5.5. The watertable is about 60 cm below the surface. This peaty, moist and acid topsoil has the advantage of quickening re-establishment of the young plants, is very well suited to the growing of ericaceous plants and further the forming of good root-balls. A drawback is the permanent shrinking of the topsoil, so that new soil (peat soil or mud from the canals) has to be brought up regularly. The subsoil consists of 3-4 m peat overlying 9-10 m of peaty clay. This softness of the subsoil causes the construction of roads and buildings to be extremely expensive (piles of 13-16 m).

The production of Boskoop is composed of ornamental plants only, the main products being a) ericaceous plants, b) ornamental conifers, c) ornamental shrubs, d) roses (esp. miniature), e) perennials. Within these groups an enormous variety of plants is grown.

The total Boskoop production in 1976 is estimated at Dfl. 100,000,000.-

The nurseries have all the same typical shape: narrow strips of land (approximately 30 m wide) surrounded by canals. The average area is only 0.8 ha, the larger nurseries being approximately 6-8 ha. The culture on these smallholdings is very intensive, it needs mostly 2-3 persons per ha. Some nurseries are more or less specialized but usually a very large amount of species and varieties is grown. A typical aspect of the Boskoop nurseries is the very intensive propagation (especially by cutting

and grafting) in greenhouse and frames. Other means of propagation are budding, layering and dividing. Nearly all nursery-activities are done by manual labour.

The soil-properties, the growth of so many different varieties and the intensive utilization of every square inch prevent any considerable mechanization. We can divide the Boskoop nurseries into 2 categories, those with and those without trade.

The export-trade is the source of life of the Boskoop nursery-centre, as 90% of its products are exported all over the world, especially to Great Britain, West Germany, Sweden, France, Italy, Belgium, Switzerland and Canada. A large share of the production in other districts of The Netherlands is also exported via Boskoop. The entire Dutch export of nursery products in 1967/1977 was ca. Dfl. 172,000,000.-.

Every year the exporters go abroad to visit their clients. The plants, which the exporters themselves do not grow, are bought from the other nurserymen. During the export season these plants are delivered at the packing sheds, which is mostly done by barge but in future, if possible, plants more and more will be transported by car too. After the inspection by the Plant protection service they are burlapped and packed in cases or baskets to be forwarded by ship, truck or train.

The research station is an association, founded by the nurserymen and governed by a board, which includes representatives of all Dutch nurseryman-organizations. Close cooperation with the extension service and research is ensured by the fact that the horticultural advisor is director of the Research Station at the same time. Both the assistants of the extension service and the research workers of the research station are cooperating in the research work. The research station is financed by the subscriptions of its members and by grants of the national organization of nurserymen, the government, the country and the municipalities. The staff is formed by 4 scientific workers, 2 assistants and 10 labourers.

The experiments are mostly focused on: propagation (cutting, grafting, rootstocks, etc.); soil- and manuring problems (drainage, pH, etc.); control of pests and diseases; chemical weed control; breeding evaluation and distribution of selected plant material; economics; work-engineering.

The extension service consists of the horticultural advisor and his 7

assistants, the staff of the research station also lending a hand. The advisory work is supported by articles in horticultural and local papers and popular folders.

Horticultural educations at Boskoop can be obtained in different ways.

- a) The secondary horticultural school, corresponding with the 4 year secondary school, has a 3 year course. The students are working in the nurseries one day a week and half a day attended instructions at school. The college affords a thorough training in horticulture (especially arboriculture) much attention being given to general education (3 foreign languages, economics, surveying, botany, dendrology, phytopathology, chemistry, manuring, pedology, physics, horticultural engineering, etc.).
- b) The college for landscape-gardening, corresponding with the horticultural college, has a 4 year course.
- c) The primary horticultural school corresponds with the ordinary elementary school. It affords a fundamental training in arboriculture. It has a 4 year course: during the first and second year lessons are given 5 days weekly, the two following years 4 and 3 days weekly.
- d) The evening-classes are the most elementary form of horticultural tuition. They correspond with the elementary school. Lessons are given two years, 3 evenings weekly.

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