

Summary

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SUMMARY

In order to compare the conventional cultivation with the biodynamical one, experimental investigations were carried out in seven different pairs of meadows in the Swiss Midlands (Map 1, p.9); each pair consisted of two neighbouring plots, one being cultivated conventionally, the other - biodynamically. With the help of several specialists, various aspects of these ecosystems were studied.

All the seven biodynamically cultivated plots proved to be richer in grasses, leguminous and herbaceous species than the conventionally cultivated surfaces. The difference is very distinct in the vegetation table listed by decreasing number of species (see detailed summary p. 40).

The soil samples from all the plots were studied as to the content of organic carbon, total nitrogen, hydrosoluble phosphate, potassium, magnesium and the cation exchange capacity. In addition, the nitrogen mineralization and mangan content were analyzed in the pairs 1 - 5.

Within the pair 1, the differences in the humus content and vegetation between the plots were particularly pronounced; for this reason, some physical measurements of soil (determination of the size of particles, density, curve of desorption as well as the suction power) were performed; see also the summary, pp. 60 - 61.

The earthworm fauna was investigated in the meadow pairs 1 - 3, the nematodes in the pairs 1 and 2, the microarthropods and the carabids in the pair 1.



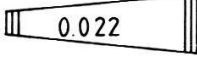
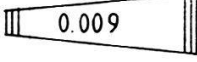
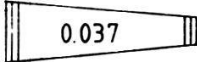
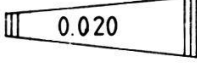
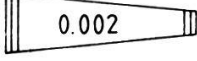
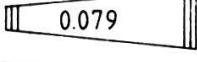
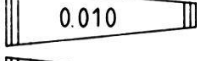
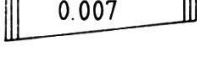
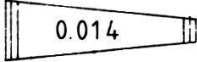
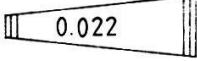
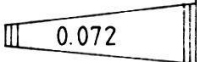
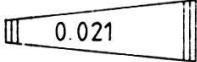
An experiment with white clover potted in the soils from the surfaces 1 - 3 showed that the biomass production in conventionally managed soils was higher than in biodynamically cultivated ones. The same results were obtained in subsequent experiments with various sorts of red clover.


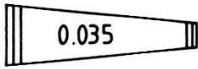
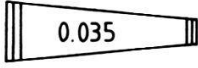
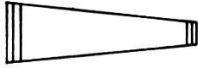




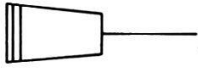



To obtain information on differences in the productivity of the meadows, the productivity of the farms 1 - 5 was studied. Detailed summary see p. 117.

The result of the present investigations are briefly summarized in Fig. 27.

Figure 27

Influence of the biodynamical and the conventional way of cultivation in seven pairs of permanent meadows in the Swiss Midlands: summary of observed differences.

| measurements | conventional meadows | | | biodynamical meadows | | | comments |
|---------------------------------------|----------------------|------|---|----------------------|--------------------|--------------------------------|----------|
| | standard deviation | mean | Wilcoxon test | mean | standard deviation | number of investigated meadows | |
| <u>Vegetation</u> | | | | | | | |
| <u>number of species</u> | | | | | | | |
| total | 5.05 | 24 |  | 40 | 11.18 | 1-7 | |
| grasses | 2.56 | 9 |  | 13 | 3.90 | 1-7 | |
| legumes | 0.49 | 1 |  | 4 | 2.15 | 1-7 | |
| herbs | 3.34 | 13 |  | 24 | 6.97 | 1-7 | |
| <u>Chemical analysis</u> | | | | | | | |
| contents of ash | 1.10 | 8.9 |  | 8.2 | 1.2 | 1-14 | |
| starch units | 0.40 | 73.2 |  | 74.8 | 0.4 | 1-14 | |
| Ca/P | 0.42 | 2.26 |  | 3.12 | 0.96 | 1-14 | |
| Ca % | 0.17 | 0.87 |  | 0.96 | 0.23 | 1-14 | |
| P % | 0.05 | 0.39 |  | 0.33 | 0.09 | 1-14 | |
| K % | 0.59 | 2.84 |  | 2.42 | 0.47 | 1-14 | |
| <u>Soil</u> | | | | | | | |
| <u>Soil physics</u> | | | | | | | |
| apparent density g/cm ³ | 0.05 | 0.71 |  | 0.63 | 0.09 | 1-7 | |
| Soil porosity % | 2.00 | 71 |  | 74 | 3.6 | 1-7 | |
| <u>Soil chemistry</u> | | | | | | | |
| organic matter 1974 % | 1.36 | 6.96 |  | 7.97 | 2.61 | 1-7 | |
| total nitrogen 1974 mg/g soil | 1.51 | 2.60 |  | 3.11 | 1.69 | 1-7 | |

| measurements Observations | conventional meadows | | | brodynamical meadows | | | comments |
|--|----------------------|-------|---|----------------------|--------------------|--------------------------------|---|
| | standard deviation | mean | Wilcoxon test | mean | standard deviation | number of investigated meadows | |
| field mineralized NO ₃ -N mg/g soil | 1.39 | 1.74 |  | 6.78 | 0.86 | 1 - 7 | also for the meadows Wilcoxon 2 0.054 3 0.034 5 0.069 |
| T total cation exchange capacity | 6.40 | 23.91 |  | 19.84 | 2.93 | 1 - 7 | |
| S sum of exchangeable metallic cations | 4.29 | 17.30 |  | 15.83 | 3.67 | 1 - 7 | |
| <u>Clover cultures 1975</u> | | | | | | | |
| dry weight in g leaves & roots 5th month | 0.36 | 1.48 |  | 0.35 | 0.07 | 1 | average for 3 sortes |
| | 0.21 | 0.80 | | 0.57 | 0.21 | 2 | |
| | 0.32 | 1.26 | | 0.52 | 0.23 | 3 | |
| <u>Soil fauna</u> | | | | | | | |
| earth worms | Lumbricus terrestris | |  | strict endogeous | | 1 - 3 | |
| microarthropods | springtails | |  | | | 1 | |
| carabids | | |  | mites | | | the higher amount of samples found on the biological plots are characteristic for more humid biotops. |
| <u>structure and productivity of the farms</u> | | | | | | | |
| diversity of production branches | | |  | | | | |
| pesticides fertiliser minerals | | |  | | | | |
| mechanization | | |  | | | | |
| productivity of the forage surface | | |  | | | | |
| farm income per labour unit | | |  | | | | |