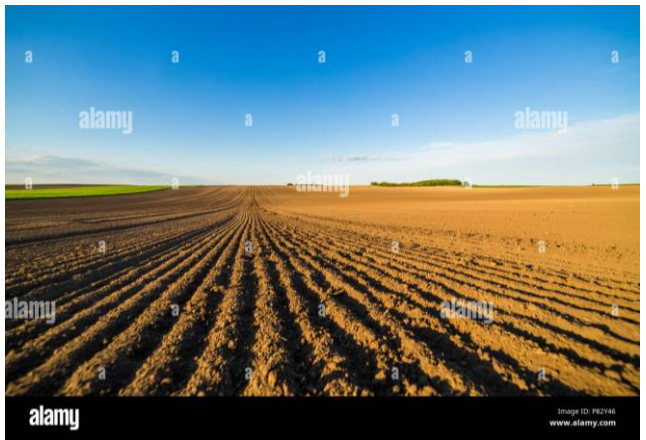
Management of Crop Production

Management of Production

Soil Management

Soil Management

- The **task of soil management** is the rational arrangement of individual plots or maneuvrators in a certain area, with the aim of making the most efficient use and strict respect for the given agrosystem.
- Agricultural land is both an **essential production condition** and a **production factor** (resource) in the creation of new utility values in the crop production sectors of each primary agri-business entity.
- On agricultural land, plant production processes are carried out, the results of which are mainly realized in addition to the boundaries of the agri-business entity and are also the basis for the economic prosperity of the crop production sectors.
- Soil and natural resources represent valuable resources of the earth, and it is a scarce resource, even if it is not the result of production. Since the amount of land is limited, it is desirable to cultivate even soil of lower quality and with a less advantageous location.
- Agro-enterprises that cultivate land in better conditions then benefit from those that farm in relatively poorer conditions.



Characteristics of land fund

A **land fund** is land of a certain area of a legal or natural person or a certain territorial unit (district, republic, etc.).

- Economic use: the Land Fund is divided into: agricultural and non-agricultural land fund

The agricultural land fund (agricultural land) consists of:

- Arable land,
- permanent forest stands,
- Vineyard,
- Hops,
- Orchards,
- Gardens.

The non-agricultural land fund (non-agricultural land) consists of:

- Forest land,
- Ponds,
- Other bodies of water,
- Built-up areas,
- Other infertile areas.
- Crop rotation.

Crop rotation

- **Crop rotation** on arable land: the practice of alternating crops grown in a specific field in a *planned pattern or sequence* in successive crop years so that crops of the same species are grown in different field.
- In a rotation the crops are **normally changed annually**, but they can be changed also on multi-annual basis.
- **Monoculture:** when the same crop is grown continuously, the term can be used to describe the phenomenon.

- **it is commonly accepted to use a threshold of 5 years** to separate arable land from permanent crops or permanent grassland, although there is no limit to the number of crops that are used in a rotation, nor in the amount of time that a rotation takes to complete**.**
- This means that if a plot is used for the same crop for 5 years or more, without in the meantime removing the preceding crop and establishing a new one, then **this plot is not considered to be in crop rotation** and therefore is **not** part of arable land.
- **Special cases of crop rotation:** There are crops that do not fit this pattern, and that are treated differently.
- For example, **hops** have been chosen to always be an arable crop, despite being **perennial** and often being renewed at intervals **beyond 5 years**, and **berries** are considered permanent crops despite being renewed sometimes annually.

Crop rotation

Crop rotation includes:

- **Land** under temporary agricultural crops, with multi-cropped areas counted only once
- **Land** that has been left fallow for less than 5 years
- **Certain crops usually treated as vegetables**, as ornamental plants or as industrial plants, such as asparagus, roses, decorative shrubs cultivated for their blossom or leaves, strawberries or hops even if they might occupy the land for more than 5 years
- **Areas with energy crops** (to produce biofuels or other renewable energy) that can be occupying the arable land for much more than 5 years such as *Miscanthus* spp.

Crop rotation excludes:

- Arable land under glass or high accessible cover (ARAS)
- **Berries plantations** even if their permanence on the plot is less than 5 years (PECR)
- **Land** that has been taken out of cultivation even if less than 5 years have passed since it was last cropped
- **Cultivated** mushrooms (U1000)

Basic terms used in land fund management

A. **Rhizome**: a natural part of the earth's surface which is separated from neighboring land by a specified boundary or ownership and also differs in the way of use.
B. A **plot:** a geometric depiction of land in real estate records. Each parcel shall be marked with a number, area and classification among agricultural crops.
C. **Sowing** procedure: an agrotechnical justified crop rotation system in a certain sequence, on a certain area of the hons, over a certain period of time.

Basic indicators

- ***Land consolidation coefficient 'Ks'*** (to be as low as possible and not exceed 3)

$$K_s = \frac{\sum the\ sum\ of\ the\ actual\ perimeter\ of\ the\ land\ (m)}{\sum perimeter\ of\ ideal\ land\ shape\ (m)}$$

- ***Share (length) of the actual perimeter of the plots in m.ha^{-1} "d"*** (its lower proportion corresponds to higher order)

$$d = \frac{\sum the\ actual\ perimeter\ of\ the\ land\ (m)}{\sum land\ areas\ (hectares)}$$

- ***Agricultural land use (reduction) coefficient 'Kr'*** (higher coefficient corresponds to more active use of the most intensive agricultural crops in a given agro-group).

$$K_r = \frac{\sum reduced\ land\ (hectares)}{\sum agricultural\ land\ (hectares)}$$

- ***Degree of arable land in %*** *(higher degree corresponds to more active use of arable land in* the agri-business body under review)

$$arable\ degree\ \% = \frac{\sum arrable\ land\ (hectares)}{\sum agricultural\ land\ (hectares)} \times 100$$

- ***Average area of land in ha and division of plots by size groups***

$$average\ rhizone\ area\ (hectares) = \frac{\sum hectares\ rhizones}{no.of\ rhizones}$$

Production stages in plant production

Production stages in plant production

The crop industries are among the **decisive factors** in solving the **nutritional problems** of the population, while limiting the further development of the livestock, processing and pharmaceutical industries. In addition, they ensure the performance of tasks of a reproductive and export nature.

The **key sectors** of plant and agricultural production are cereals, which are internationally classified as strategic sectors, especially in terms of nutrition, commerciality and economics.

From an **economic point of view**, the winter wheat production, sectors of spring barley and grain maize, are among the most stable within commonly grown arable crops in agro-business entities, except for extreme production conditions.

Crop Production Processes

- The **basic task of plant production** is to effectively ensure the food safety threshold of our population by the desired products of plant origin, meeting:

  - the needs of processors and nutrition of livestock, as well as tasks of a reproductive and export nature,

  - while respecting the principles of a systematic cycle of nutrients in nature.

- In addition, it is desirable to create, where specific possibilities, conditions for alternative production and development of biotechnology in plant production, as is the case in developed Western European countries and the USA. These tasks are closely linked to the Comprehensive Land Production Potential Program, which focuses on the restructuring of production and land use.

Characteristics of crop production processes

- 1. The **biological nature** of crop production,
- 2. Land as an **essential production factor** in agriculture,
- 3. The **time mismatch** between production and working hours,
- 4. **Dependence** of the processes and results of crop production processes on natural and climatic conditions,
- 5. **Seasonality** in the consumption and use of workers and means of tangible fixed assets,
- 6. Crop production is of a **flat nature**,
- 7. Production processes in plant production are arranged in parallel,
- 8. Multi-production nature of some crop production processes.

Characteristics of crop production processes

From a **sectoral point of view**, crop production processes is characterized by the following:

- Crop production is made up of sectors, divided into groups of sectors (cereals, fodgings, vegetables, etc.).
- Furthermore, groups of sectors form individual sectors such as winter wheat, spring barley, green maize and silage, etc.
- The management and organization of crop production shall be dependent on:
    - the **size** of the entrepreneurial agro-subsidy,
    - the **number of field** seeding procedures in the territory,
    - the **structure** of agricultural crops and the resulting part of the production structure of crop production,
    - forms of assignment of technical means within the production and organizational unit,
    - natural and economic conditions, as well as the ruggedness of the terrain.

Characteristics of crop production processes

From **Economic point of view:**

- Cereals are among the crops achieving the highest level of profitability.
- Cereals provide approximately 40% of the energy value in the diet of the population. Also, they are important because:
    - the bulk of cereal production is consumed for feeding livestock (approx. 70%),
    - cereal production in the range of 6-7 % is used in the food, malting, distillery and starch industry (this includes the production of seeds),
    - some cereals are used as dietetic foods with medicinal effects after treatment,
    - are important for crop rotation in the sowing process,
    - they are allocated to the crops with the lowest production factors,
    - provide a by-product (straw) that is partly used for feed targets or supplies organic matter to improve soil fertility or is used for energy production (e.g. in Austria);
    - it appears appropriate to produce pure ethanol from wheat as an additive to the fuel of tractors,
    - support for the economization of the energy economy is envisaged in the perspective.

Cereal Production Process

Cereal Production Process and its organizational characteristics:

PHASE	PRE-PRODUCTION	PRE-MAKING	MAKING	POST-MAKING (FINISHED)
1	selection of the hone	autumn soil preparation	Finding	grain drying
2	selection of cultivated crop	spring soil preparation	mechanical treatment of stands	cleaning and sorting of grain
3	determination of cultivation technology	seed preparation	chemical treatment of plantations	dispatch and storage of grain
4			biological control	
5			harvesting of grain and straw	

Source: Paska 2009

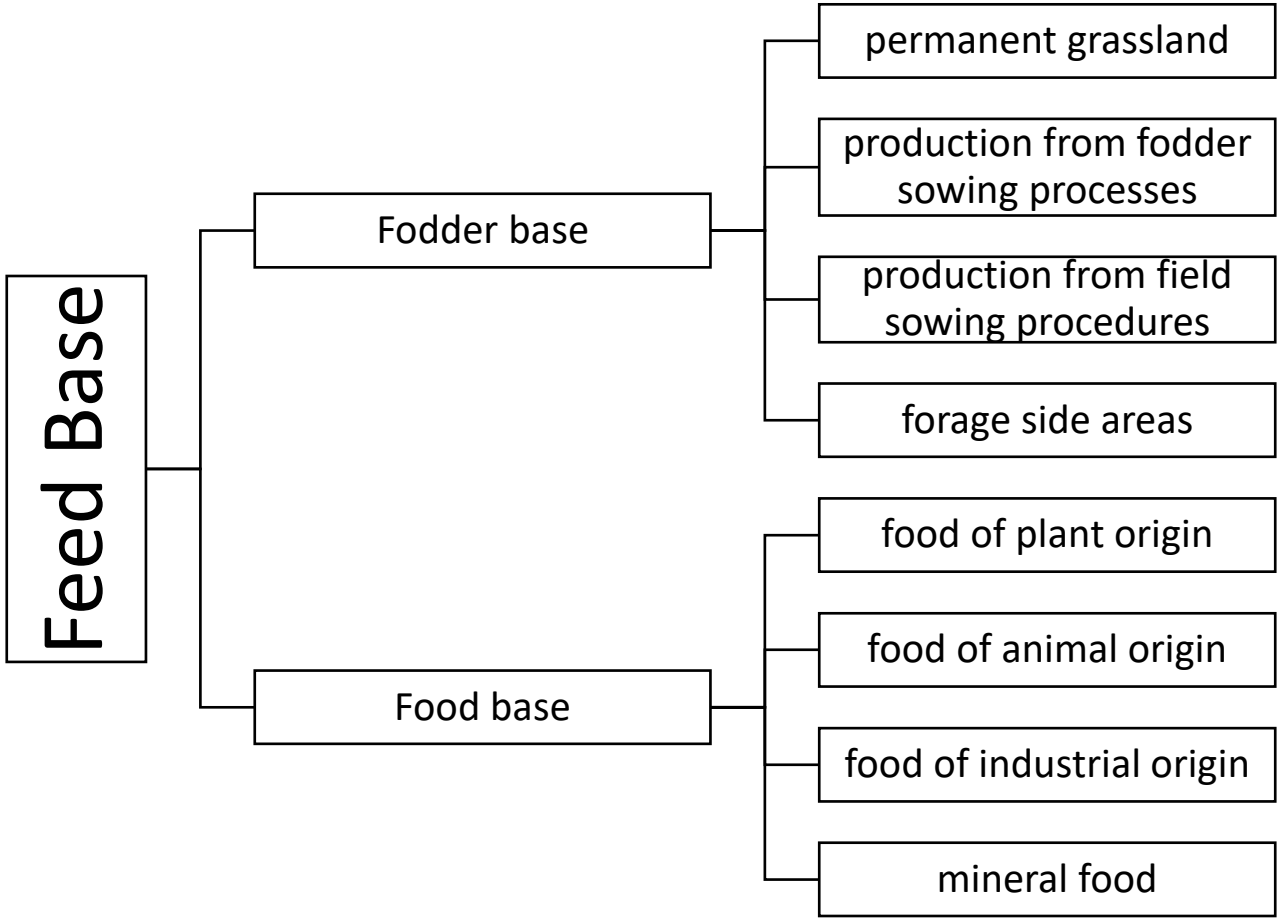
Feed base management

Feed: also called animal feed, food grown or developed for livestock and poultry.

• The **source** of feed production is the industry, which provides a feed product designed for nutritional purposes when feeding livestock.

• The **task of management** of the feed base is to determine the species and extent of feed sources and to ensure their acquisition and use so that the requirements for full nutrition of livestock are met in a smooth and efficient way, taking into account the development of stocks, performance and production of other animal products.

Feed base Overview



Source: Paska 2009

Feed base Overview

1. Permanent grassland (permanent grassland and permanent pasture)

- In our soil-climatic conditions, it produces the necessary organic matter, used in particular for the feeding objectives of the 2000s.
- An area whose permanent grassland is used only in a pasture way, i.e. without obtaining at least one hay forage, is generally referred to as permanent pasture.
- Conversely, an area whose permanent grassland provides at least one mowing of hay material is referred to as a permanent meadow.
- The production of grassland and pasture constitutes an intermediate product for agricultural operators and is therefore not intended for market production and….
- Therefore, its turnover and/or yields are not allocated.
- The areas under permanent grassland and the use of their production represent a significant margin of feed base, which in our conditions is used below half its production potential.

Feed base Overview

3. Areas of feed sowing procedures

- They are typical of specialized and large-capacity production-organizational units of cattle or sheep farming.
- In feed sowing procedures, stewardess forage should occupy at least two or more hons.

4. Forage areas in field sowing practices

- is typical of normal agricultural primary production operators.
- At the same time, in these units, they represent the second most important group of industries in the framework of the crop production structure.
- Forage in field sowing procedures consists mainly of:
    - multiannual fodgings (alfalfa, woodpeke red double-bevel ai.),
    - annual fodgings (green and silage maize and other annual fodgings),
    - feed seasonings (beet, potatoes, topinambur ai),'
    - feed catch crops (summer, dimming and winter mixers).

Feed base Overview

5. The sub-areas of forage shall

- are those which, in addition to the production of the main products, also provide a by-product usable for feed purposes.
- Such an area is e.g. the harvest area of cereals, which also provides a by-product - a feed straw and often with a sowing, suitable for feed purposes.
- Similar are the sugar beet harvesting buds, which provide leaf and other products, as well as the harvesting areas of some of the vegetables, feed beet, etc.

Forage production process: characteristics

The content of the forage production process is determined by the following factors:

- the type of fodder,
- soil and climatic conditions,
- cultivation technology and, in particular, harvesting,
- the method of preservation.

Forage production process: stages

	Phase	Annual forage	Multiannual forageg	Permanent grassland
1	Pre-making	plowing soil preparation Fertilizing	plowing soil preparation fertilization (limeing)	
2	Making	Finding priming mowing (harvesting)	sow for cover crop priming harvesting of cover crop treatment of forage after harvesting of the cover crop according to the number of mowers is repeated: mechanical treatment, fertilization, mowing, grazing	fertilization with organic fertilisers fertilization with fertilizers mechanical treatment according to the number of mowers is repeated: mechanical treatment, fertilization, mowing, grazing
3	Post-making	preservation of matter by mechanical, physical, chemical and combined means		

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