

Name:

Crop rotation

Definition:

Crop rotation on arable land is the practice of alternating annual crops grown on a specific field in a planned pattern or sequence in successive crop years so that crops of the same species are not grown without interruption on the same field. If the same crop is grown continuously, the term monoculture can be used to describe the phenomenon (Eurostat). The rotation of different species of cereals (for example wheat, barley, oats, wheat, etc.) is also considered as crop rotation.

Arable land is considered to be out of the crop rotation system when it is cultivated with the same crop for at least 3 years in a row and when it is not part of a planned crop rotation.

Crops rotation allows the risk diversification in the farm:

- The root system of crops is different and therefore it improves the efficiency of soil nutrients. Different crops have different root systems and therefore that improves the efficiency in taking all the soil nutrients.
- Rotations may also give benefits in terms of improved soil quality (more or deeper roots; root exudates), better distribution of nutrients in the soil profile (deep-rooted crops bring up nutrients from below) and to increase biological activity.
- Many crops may have positive effects on succeeding crops in the rotation, leading to greater production overall.
- Through rotations, peak labour times may be reduced and labour better distributed throughout the year if planting and harvest times are different. Crop rotations may decrease risk as bad seasons, or bad parts of a season, may affect some crops more than others.
- Pests, diseases and weeds are easier to control because crops planting seasons are different and because the susceptibility to pests, diseases and weeds, is different for each crop. Rotations are used to reduce pests and diseases in the cropping system and to control weeds by including smothering crop species (e.g. cowpeas) or green manure cover crops.
- Crop rotations can balance the production of residues by alternating crops that produce few and/or short-lived residues with crops that produce a lot of durable residues.
- The most effective rotations combine crops with different growth strategies (deep rooting versus shallow rooting; nutrient accumulating versus nutrient depleting; water accumulating versus water consuming etc.).
- It is important to rotate different species, and especially species that have different pests and diseases.

Method of calculation:

The value of this indicator is calculated as:

$$R = \sum_{i=1}^n (P_i \times C_i)$$

Where P_i is the proportion of area occupied by the crop i

$$P_i = \frac{A_i}{\sum_{i=1}^n A_i}$$

A_i is the area assigned to the plot i (ha)

i is each of the plots (1, 2, 3,.....)

C_i is a coefficient that depends on the previous crop. If the previous crop is the same as the current one $C_i = 0$, otherwise $C_i = 1$

The index takes values from 0 (monoculture in all the plots), to 1 (all the plots present crop rotation).

Interpretation:

The index is directly related to the rotation in the farm (?). Its value ranges between 0 and 1. The value 0 indicates a monoculture and its increase means the increase in the number of crops and their proportion regarding the crop surface. 1 indicates that all the plots present crop rotation.

Information source:

The different crops surface data are obtained in a farmers survey.

Bibliography and references:

Eurostat glossary, http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Crop_rotation