

Arable forage and permanent grassland systems

Cultivation of forage legumes in legume-grass mixtures constitutes the basis for soil fertility in organic farming systems both for livestock and cash crop farms. Through biological nitrogen fixation by clover and alfalfa, nitrogen is supplied to non-legume plants both directly (increase in soil nitrogen available for plants) and indirectly (nitrogen return by means of application of organic manure).

For evaluation of medium- to long-term fertility changes of individual fields and the whole farm, nitrogen balances are a useful tool. However, estimations of the N-fixation of legume-grass mixtures are difficult under on-farm conditions. N-fixation is largely determined by two factors: total yield and the legume percentage in the total yield. While the total yield can be estimated relatively easily (e.g. by the number of truckloads, number of big bales and the silo content), information on the legume percentage is usually not available and varies between < 5 % up to > 90 %.

Permanent grassland differs much from arable forage systems. It contains a variety of grasses, herbs and clovers. The percentage of clover can vary between < 5 % up to 40 %. The aim for a sustainable system is a well-balanced share between grasses, herbs and legumes and not the maximization of the legume percentage (in contrast to arable forage systems).

Legume estimation trainer

With some practice, the legume percentage can be estimated visually. However, there is often neither enough time for the determination of the actual legume percentage through cutting samples and sorting, nor an experienced estimator for instruction.

One solution is this estimation trainer which is based on images of legume-grass swards with associated mass proportions which are derived from measurements. The arable forage samples originate from organic farms in Brandenburg (Germany), while the permanent grassland samples were taken in Baden-Wuerttemberg and Brandenburg (Germany).

This training program provides an economical and enjoyable alternative to color prints. Per mouse click, randomly selected images including information on the average height of growth and total fresh and dry matter are displayed. An estimation of legume percentages in steps of 20 % can be entered using a keypad shown on the screen. A notification shows if the estimation was correct or wrong. A new picture can be called by clicking on the key "new picture". Please read the manual for this trainer and enjoy the training!

To monitor your training, automatically the success rate is shown in %. If you have a success above 50% you estimate every second picture correctly. Aim to reach as close to 100% as possible! The success rate is calculated as the number of correct estimations (first try) divided by the total number of estimated pictures. In order to compare different pictures you can go back and forward in the history of your estimations by clicking the arrows.

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