

# Possibilities of estimating the yield and quality of forage harvested from meadows of high natural value with non-destructive methods



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## Introduction

Non-destructive methods and tools for measuring the quantity and quality of grassland sward have recently become more and more used in European farms. One of them is measurement of the herbage yield, using the Rising Plate Meter (RPM). The aim of our study was to assess the yield and its quality in periodically excessively wet meadows, with low, multi-species sward and with patches of protected plants, using non-destructive methods.

## Materials and methods

The study was carried out in 2019-2021, in 11 extensive meadows located in the valley of Rządza river (central Poland). Vegetation was identified, based on analysis of phytosociological relevés (Braun-Blanquet method).

Two methods of yield evaluation (first cut) were compared: 1) sward height and sward density measurement with ruler, and yield (Y) calculation according to Kostuch (1982) formula:  $Y = (r - s) \times 0.6 \times (z/100) \times 0.2$ , where r – height of the main sward mass, s – cutting height, 0.6 – yield of 1 cm sward (green hay) per 1 ha [t] at 100% sward density, z – sward density [%], 0.2 – conversion of green hay to DM, 2) using the RPM, which measures the height of compressed sward and calculates the available DM ha<sup>-1</sup> using the conversion equation.

Quality of forage was determined using the fodder value score (FVS) according to Filipek (1973).



## Results

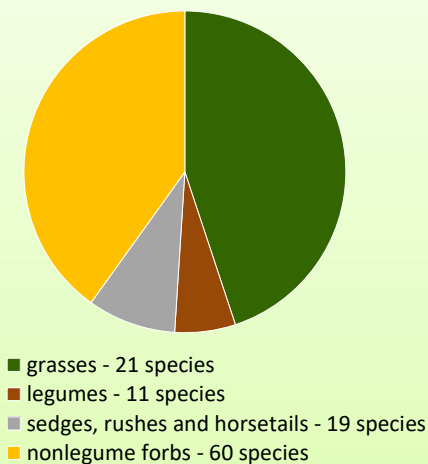


Fig. 1. Average percentage of coverage by plant groups and the species richness of these groups.

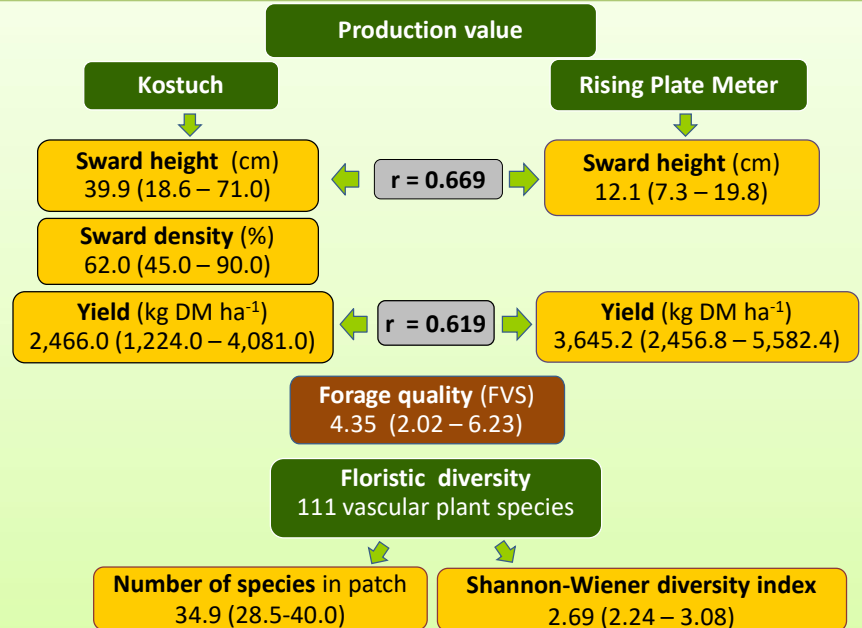


Fig. 2. Production value of meadows (mean and range) and their floristic diversity

## Conclusions



- Wet meadows with patches of protected species located in the Rządza River valley are characterized by high floristic diversity and low yields of moderately quality.
- Both the sward height and yield values obtained using both methods (RPM and Kostuch) were positively correlated.
- RPM overestimated the yields, when the sward was high and included species with thick stems. The problem was also with uneven swards, empty spaces and dense tufts of grasses, sedges or rushes. The use of RPM in such meadows needs further calibration.