Conference for Wetlands: Monitoring, Modelling and Management
22-25 September 2005, Wierzba, Poland

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Controlled run-off from agriculturally used peatlands in the Noteć river valley and its effect on water status of peatlands

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- **Peatlands in the Noteć river valley and its present status**
- **Location of the lysimetric-meteorological station „Frydrychowo”**
- **The goal of the research**
- **Lysimeter investigations**
- **Measurements**
- **Results**
- **Conclusions**

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The upper Noteć river catchment – 4098 km^2

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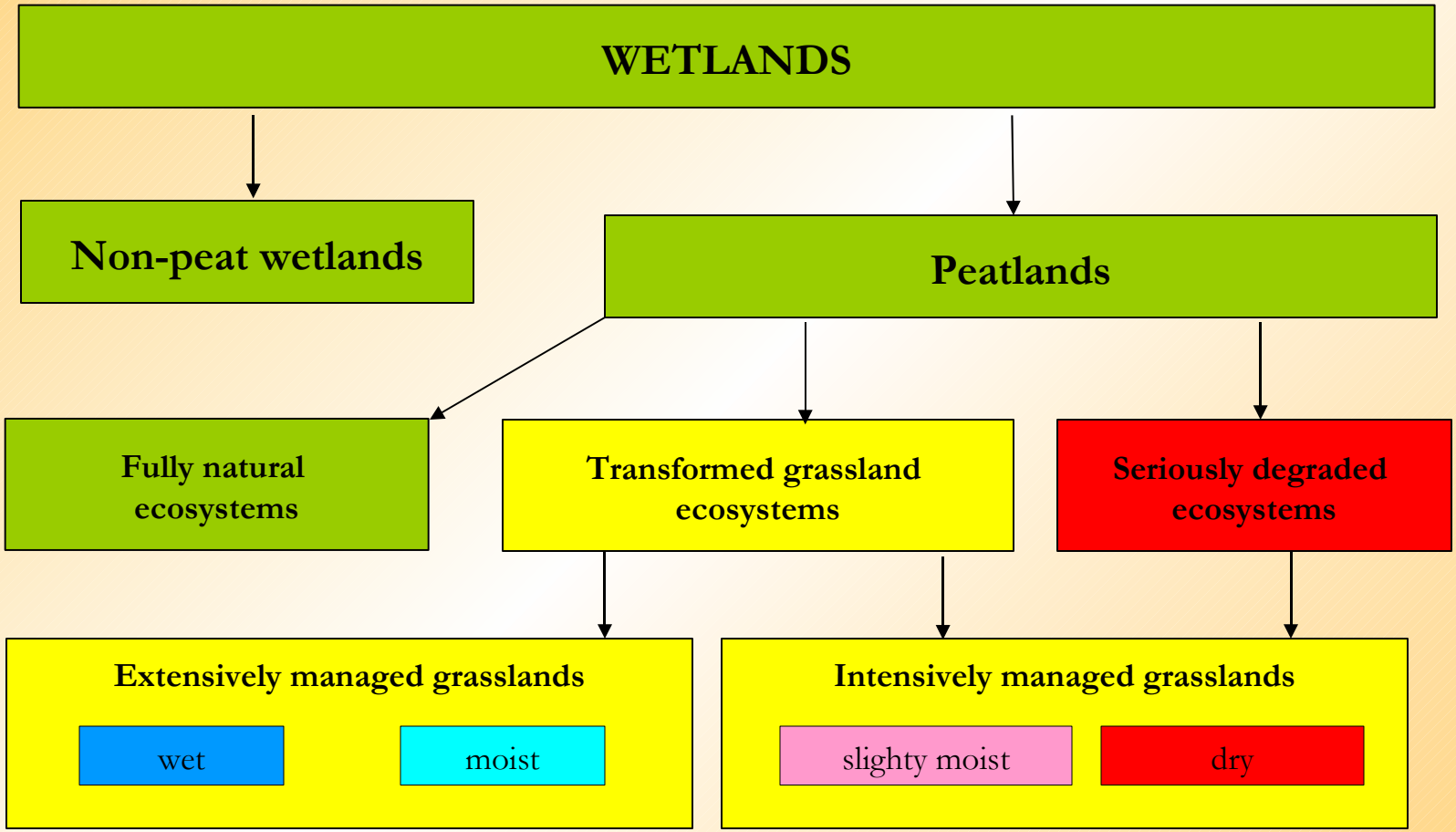
PEATLANDS IN THE NOTEĆ RIVER VALLEY



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THE GOAL OF THE RESEARCH

The goal of the study was to examine and determine the effect of the spring drainage depth on the course of the groundwater table and of the moisture of soil root layer as well as to demonstrate how far the simple methods of controlled outflow from peatlands can be used for maintaining soil moisture proper for peatland protection.

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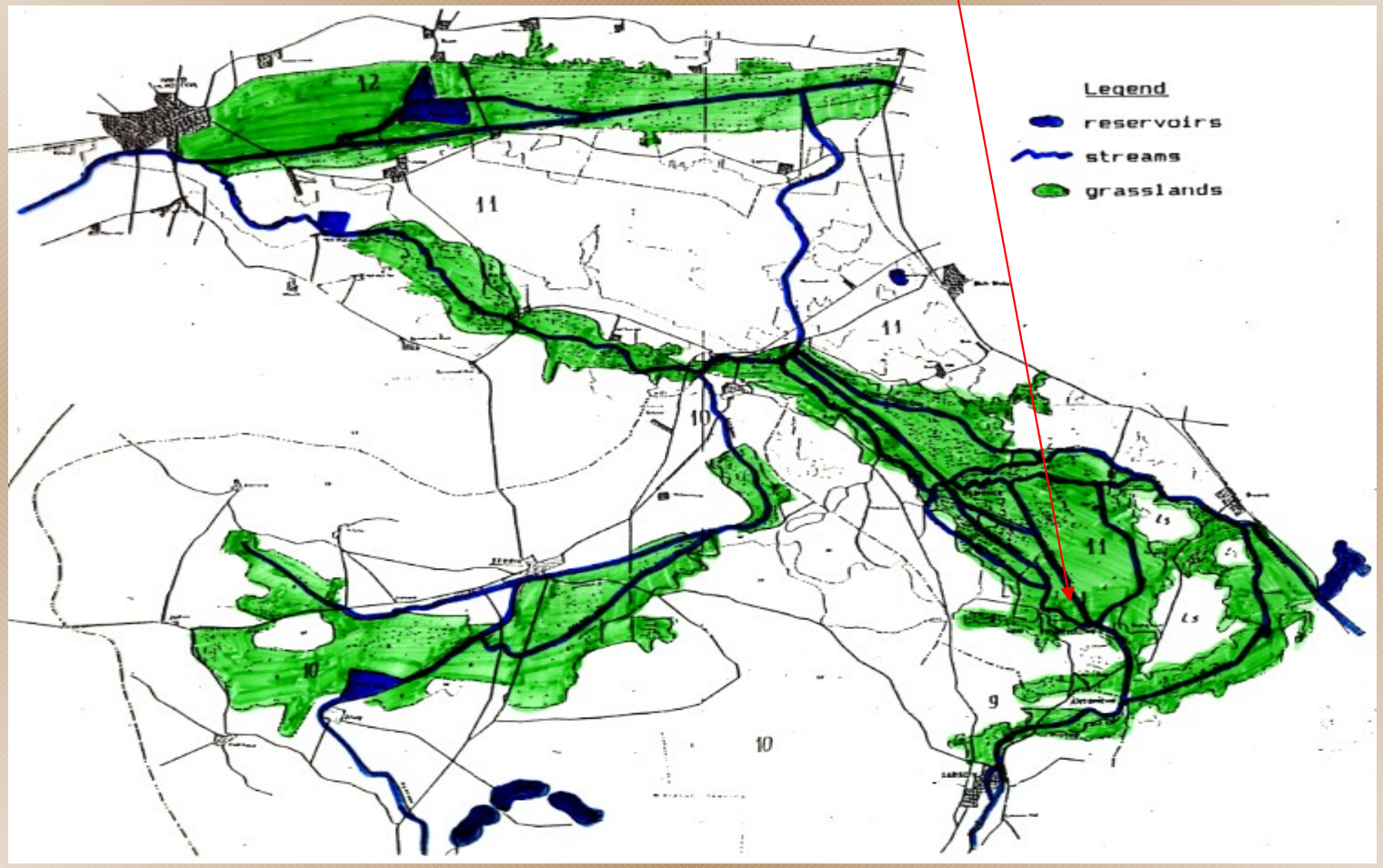
Location of the lysimetric-meteorological station „Frydrychowo”



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LYSIMETER INVESTIGATIONS

⇒ field investigations carried out in 2002-2004

⇒ 20 lysimeters weighed every 10 days from April till September

⇒ five variants of spring groundwater lowering *H*:

- A: H =0 cm
- B: H = 25 cm
- C: H = 40 cm
- D: H = 40 cm + q
- E: H = 70 cm

⇒ four lysimeters in each variant

⇒ peat-moorsh soil MtIIbc

⇒ two-cut meadow use

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MEASUREMENTS

- groundwater table depth z, soil moisture, evapotranspiration ET and hay yield Y measured in each term and averaged for four lisymeters in each variant
- for the average soil moisture pF was determined from the pF curve
- meteorological measurements using automatic meteorological station

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Fig 1 (a) Groundwater table depth *z* in the root zone in different variants of the spring ground water lowering *H* in 2002 in Frydrychowo

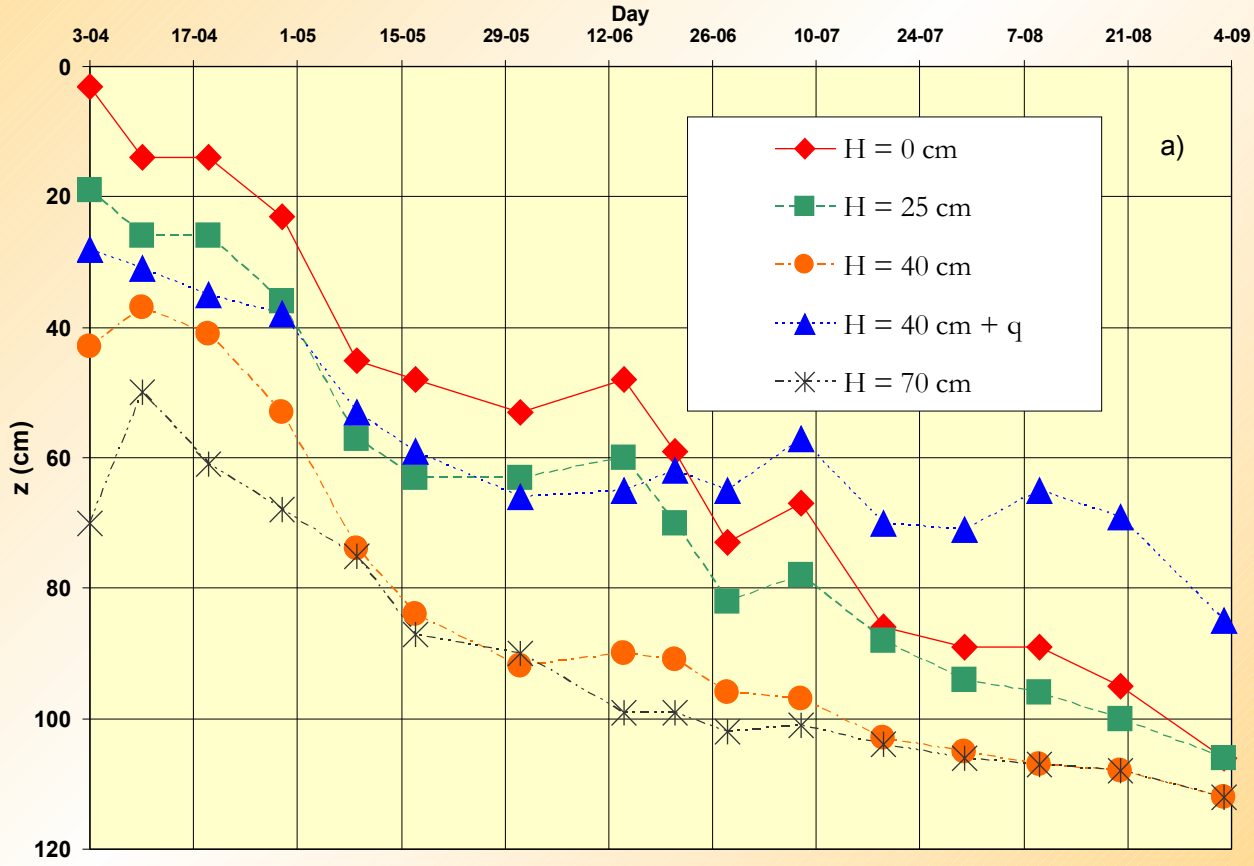

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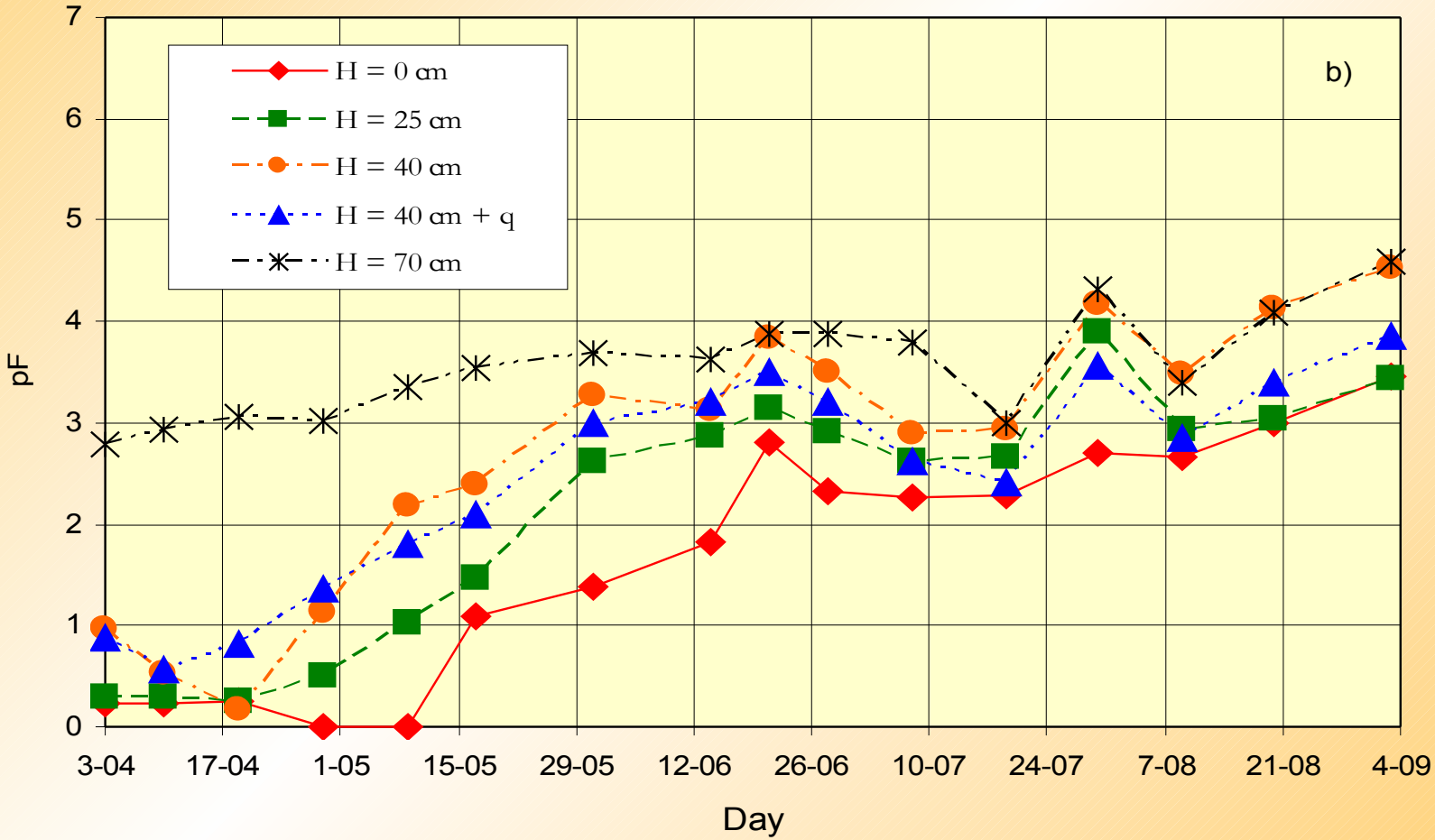
Fig 1 (b) Soil water potential *pF* in the root zone in different variants of the spring ground water lowering *H* in 2002 in Frydrychowo



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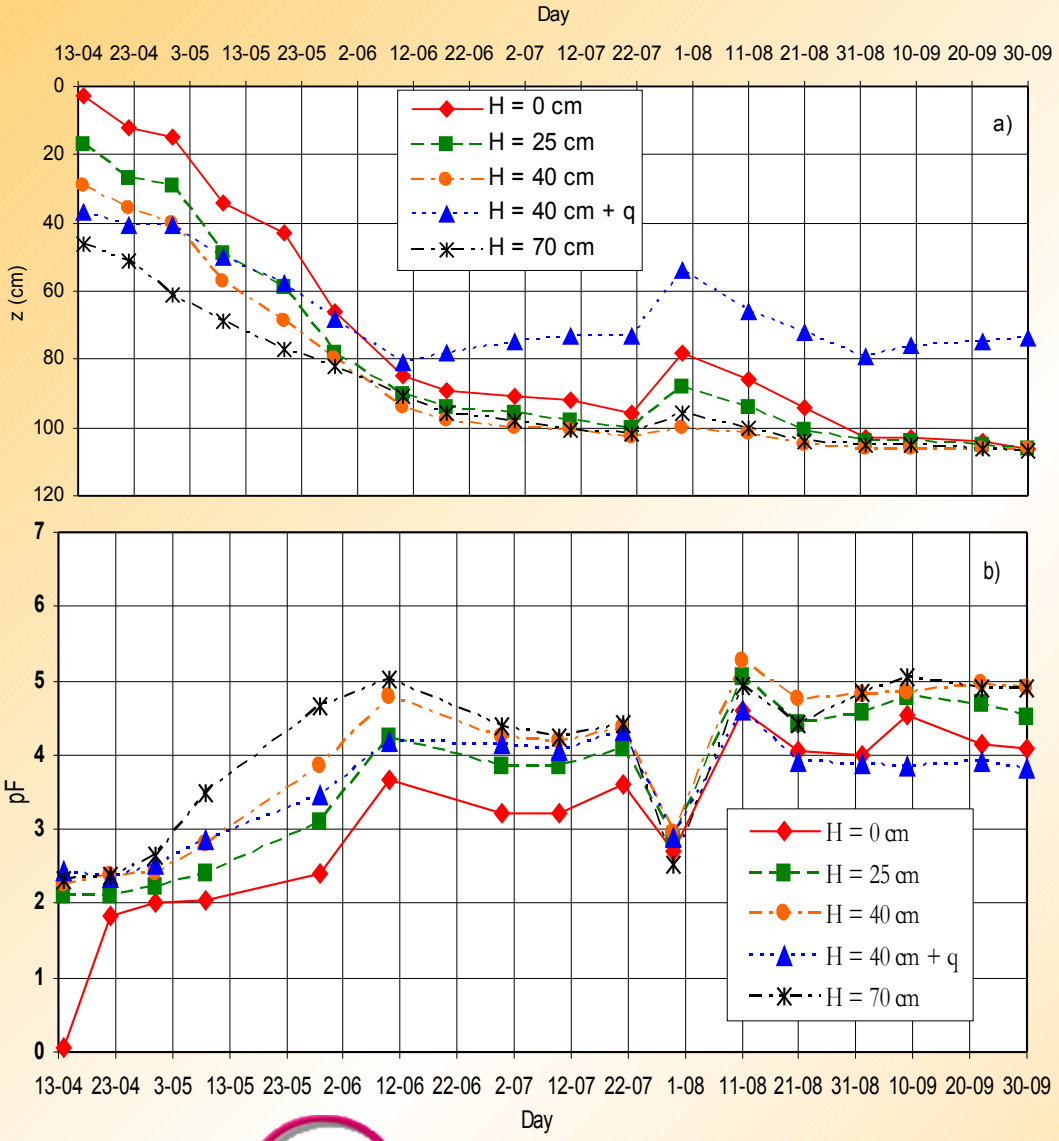

Groundwater table depth *z* (a) and *pF* in the root zone (b) in different variants of *H* in extremal dry conditions of 2003

Month	Mean sum of precipitation at Frydrychowo in 1973-1995 (mm)	Mean sum of precipitation at Frydrychowo in 2003 (mm)
IV	22	26,4
V	43	15,8
VI	59	36,2
VII	67	132,2
VIII	52	11,6
IX	41	16,2
IV-IX	285	238,4

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Significance of the effect (according to the F-Snedecor test) of the spring drainage depth *z*, *pF*, evapotranspiration *ET* and the hay yield *Y* of two-cut meadow in 2002-2004 at Frydrychowo

Dependent variable	Probability
z	0.000
pF	0.000
ET	0.044
Y	0.043

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Significance of the differences (according to the Newman-Keuls test) in *z*, *pF*, *ET* and *Y* of two-cut meadow in 2002-2004 at the variants of spring drainage *H*

Independent variable	Differences between variants									
	A-B	A-C	A-D	A-E	B-C	B-D	B-E	C-D	C-E	D-E
z	**	**	-	**	*	**	**	**	-	**
pF	**	**	*	**	-	-	**	-	-	**
ET	-	-	-	-	-	-	-	-	-	*
Y	-	-	-	-	-	-	-	-	*	-

Variants of the depth of spring drainage: A – 0 cm; B – 25 cm; C – 40 cm; D – 40 cm with groundwater feeding rate of 1mm·d^{-1}; E – 70 cm

** difference significant at the level $\alpha = 0.01$

* difference significant at the level $\alpha = 0.05$

\- lack of significant difference

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CONCLUSIONS

The results show that controlling groundwater table depth in the meadow sites with organic soils in the river valley with the method of controlled outflow ensures high soil moisture required for peatland protection.

The least outflow depth can be regarded as agro-enviromental normative depth of controlled outflow. In the case of analysed peat-moorsh soil of the kind MtIIcb the drainage may consist in water removing from the ground surface.

Using very shallow drainage in spring one can expect some unfavorable conditions for agricultural use of peatlands due to high soil moisture, comprising delay of the beginning of vegetation, difficulties in agro-technique, fertilization and other spring measures performing in grasslands.

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