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Review Article

Water Footprint of the Protein Formation of Six of Field Crop Species

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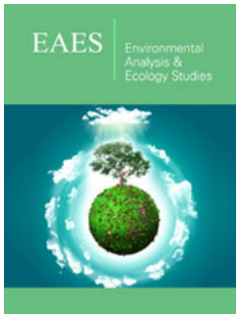

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Introduction

The availability and the consumption of water is one of the major physiological factors influencing plant growth and development. Water footprint is an indicator that shows the extent of water use in relation to consumption. Water use, consumptive use, and evapotranspiration are terms used interchangeably to describe the water consumed by crop plants Most of water is mainly used for physiological processes, only a negligible amount is retained by the crop for building its tissues. Water requirements for crops depend mainly on species and environmental conditions [1].

Materials and Methods

An agronomic study has been done at the Hungarian University of Agriculture and Life Sciences, Gödöllő to evaluate and identify the water footprint of protein yield of field crop species. Six field crop species (Sugar beet *Beta vulgaris*, winter barley *Hordeum vulgare*, winter wheat *Triticum Aestivum*, Maize *Zea Mays*, *Potato Solanum Tuberosum*, and Alfalfa *Medicago Sativa*) were involved in the study. Evapotranspiration patterns of the crops studied have been identified and physiologically reliable protein ranges within crop yields were evaluated [2].

Result and Discussion

Water footprint of six field crop species (Sugar beet *Beta vulgaris*, winter *barley Hordeum vulgare*, winter wheat *Triticum aestivum*, Maize *Zea mays*, Potato *Solanum tuberosum*, and Alfalfa *Medicago sativa*) were evaluated.

The results obtained in this research are presented in Table 1 suggest, that water footprint of cereals proved to be the lowest, however maize values were highly affected by the high variability of protein yield. Alfalfa, potato, and sugar beet water footprints were in accordance with their evapotranspiration patterns (Figure 1).

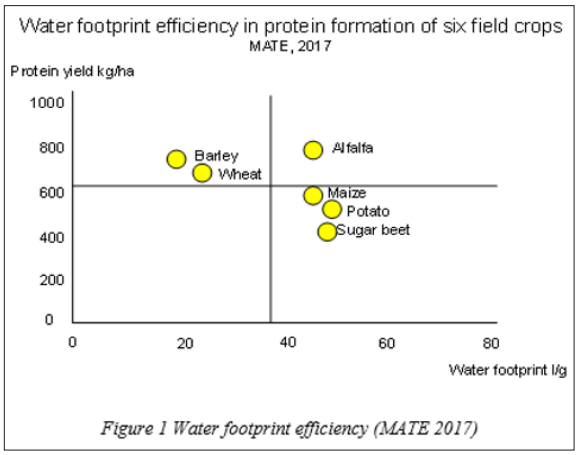

Figure 1: Provides information on the magnitude of protein yields of certain field crop species and the amount of water used for its formation.

Table 1: Water footprint of six field crop species (MATE, 2017).

Crop	Protein %	Crop Yield tha^{-1}	Protein Yield $kgha^{-1}$	Protein kg/ET mm	Litre/Protein g
Medicago sativa	18,0	4,35*	783	1,32	44,9
Solanum tuberosum	2,0	24,9	498	0,97	52,7
Beta vulgaris	1,1	41,2	453	0,96	49,1
Triticum aestivum	13,0	4,8	624	1,83	23,1
Hordeum vulgare	16,5	4,1	676,5	1,88	18,9
Zea mays	9,5	5,8	551	1,09	46,5

*hay

Conclusion

Physiological characteristics of field crop species highly influenced the magnitude of their water footprint. According to the results of the study protein yield proved to be the most reliable basis for comparison of water footprint performance. Water footprint of cereal crops seems to be much less than that of other field crops. Further studies are needed to clear and obtain more detailed data concerning water footprint of field crops [3].

Acknowledgement

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