kg dry weight (300 kg / ha Mg treatment). According to our observations, the height of the fenugreek stock reached 50 cm in 2019. The dry weight mean after harvest is *28.2 kg* dry weight (300 kg / ha Mg treatment). The results of the second experimental year are higher than the first year. **Conclusions.** The magnesium fertilizer resulted in an increase in the green weight of the fenugreek.

Keywords: *weed control; Fenugreek (Trigonella foenum-graecum L.); nutrient supply; open field experiment; yield.*

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Early prediction of winter wheat (*Triticum aestivum* L.) grain yield using spatial normalized difference vegetation index

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Purpose. Early yield prediction is an important task of modern agriculture, providing great opportunities for better crop management and enhance the advantages of implementation of the systems of precision agriculture. Winter wheat is the major cereal crop in Ukraine. In order to forecast winter wheat (*Triticum aestivum* L.) grain yields prior to harvesting in the systems of precision agriculture, we developed prediction models on the basis of remotely sensed normalized difference vegetation index values at the stages of the crop tillering (stage 5) and heading (stage 10.1). **Methods.** The model of grain yield prediction has been developed on the basis of regression analysis of the field yield data of the crop, obtained during 2017-2018 at the research fields of the Institute of Irrigated Agriculture of NAAS, in connection to the spatial vegetation index values in corresponding stages of the crop growth. Polynomial regression analysis was implemented in order to determine the link between the yields and vegetation index values at the two stages of the crop development. Statistical analyses were performed at $p > 0.05$. **Results.** The results of the study revealed the possibility of early (up to 60-70 days in advance in case of use the index values at the tillering stage) winter wheat grain yield prediction by linking the values of normalized difference vegetation index of the crop to its productivity. Approximation of the developed polynomial regression models proved that their accuracy is enough to provide reliable yielding forecasts: the mean absolute percentage error of the models is 7.76-8.53%, R2 values for the prediction is 0.9331-0.9454. **Conclusions.** The developed polynomial regression models allow obtaining early grain yield prediction using spatial normalized difference vegetation index values. The models are easy to use and will be especially practical in the systems of precision agriculture.

Keywords: *precision agriculture; regression analysis; remote sensing; yield forecasting.*

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Germination seeds of millet genotypes under the influences of peg 6000 solution on the 3^{d} and 6th days

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Purpose. Screening drought tolerance of five varieties millet ('Omriyane', 'Kharkivske 57', 'Konstantinovske', 'IR 5', 'Slobozhanske') using as osmotic stress PEG 6000. **Methods.** Water stress was applied through six concentrations of PEG (6000 MW) (0.0% (control), 11.5%, 15.3%, 19.6%, 23.5% and 28.9%), with osmotic stress 0,0 (control) -1.9, -3.1, -4.8, -6.6 and -9.7 bars. **Results.** Results of this study revealed that water stress had significant negatively effects on seed germination, root and shoot system of millet on the 3^{d} and the 6th days. Genotypes had significant differenced to water limited and new varieties with high level resistance to water stress can be created in breeding for drought resistance. Osmotic stress strongly suppressed seed germination of millet at a -3.1 bars (46.8%) and -4.8 bars (28.66%) on the 3^{d} day but on the 6th day, the number of germinated seeds increased 92.8%, 84.0% respectively. The minimum germination capacity was observed