

# **Report on field experiment in winter wheat biofortification by Zn and Se**

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## **Two experiments in Croatia and Serbia:**

### **I. experiment**

- 2-years experiment: 2011-2013
- 2 sites
- 3 genotypes
- biofortification by Zn and Se

### **II. experiment**

- 2-years experiment: 2013-2015
- 4 sites
- 2 genotypes
- biofortification by Zn and Se + N





## Experiment sites in Croatia and Serbia



## **Soil properties:**

- Calcareous soils ( $\text{pH}_{\text{H}_2\text{O}}$  7,0-8,5)
- SOM 1,8-3,0 %
- Moderate Zn content (45-67 mg/kg) and availability
- Low Se content (0,15-0,29 mg/kg, only 1 site 0,42)

## **Winter wheat genotypes:**

- Divana (in Croatia and Serbia)
- Simonida (in Croatia and Serbia)
- Srpanjka (in Croatia)
- Renan (in Croatia)



## **Biofortification by Se:**

### **I. experiment**

- control without Se
- 5 g/ha Se – foliar
- 10 g/ha Se – foliar
- 10 g/ha Se – top soil

### **II. experiment**

- control without Se
- 10 g/ha Se – foliar
- 10 g/ha Se – foliar + 20 kg/ha N

## **Biofortification by Zn:**

### **I. experiment**

- control without Zn
- 1,5 kg/ha Zn – ZnSO<sub>4</sub> foliar
- 1,5 g/ha Zn – ZnEDTA foliar
- 1,5 g/ha Zn + N – ZnSO<sub>4</sub> foliar

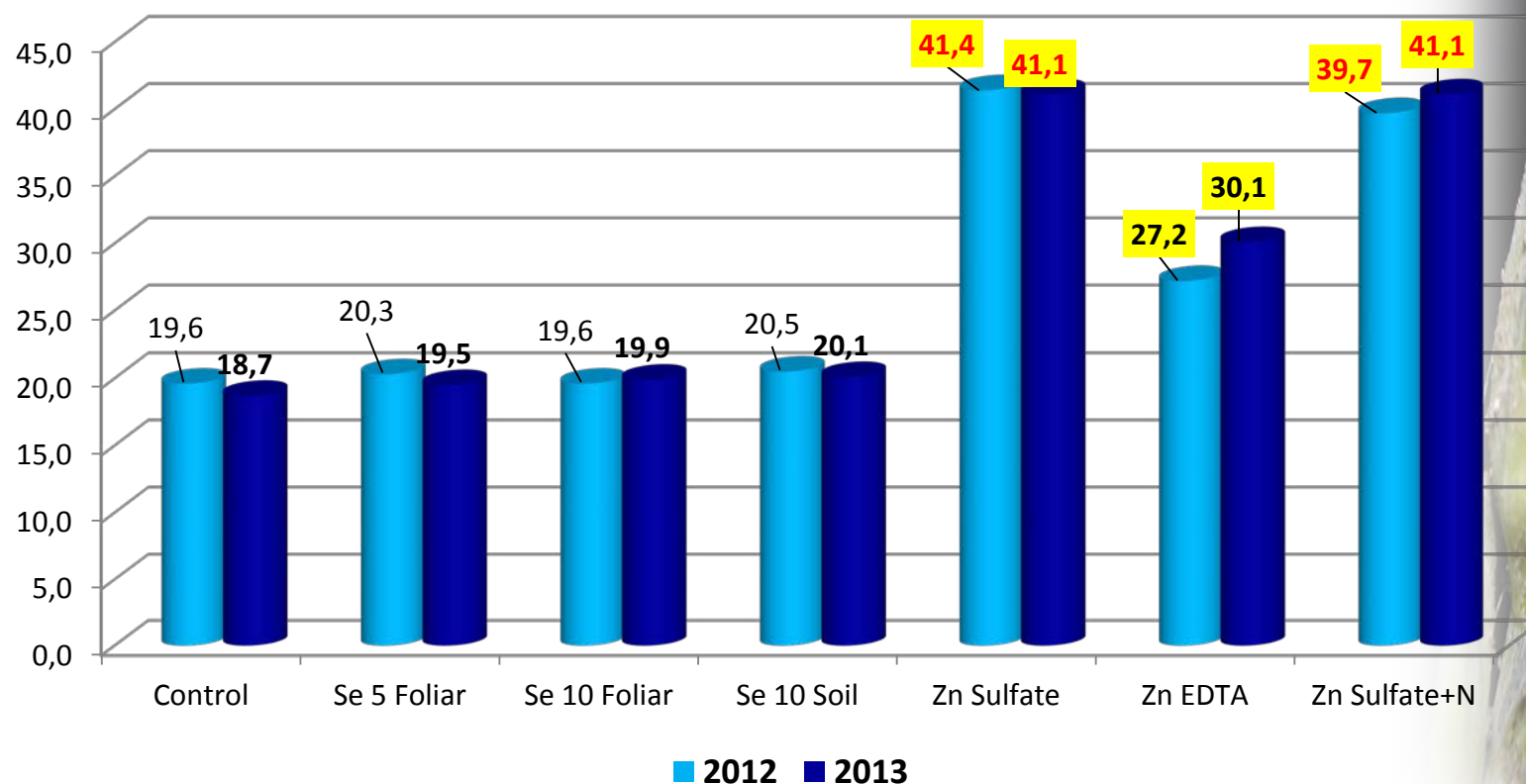
### **II. experiment**

- control without Zn
- 1,5 g/ha Zn – ZnSO<sub>4</sub> foliar
- 1,5 g/ha Zn + N – ZnSO<sub>4</sub> foliar

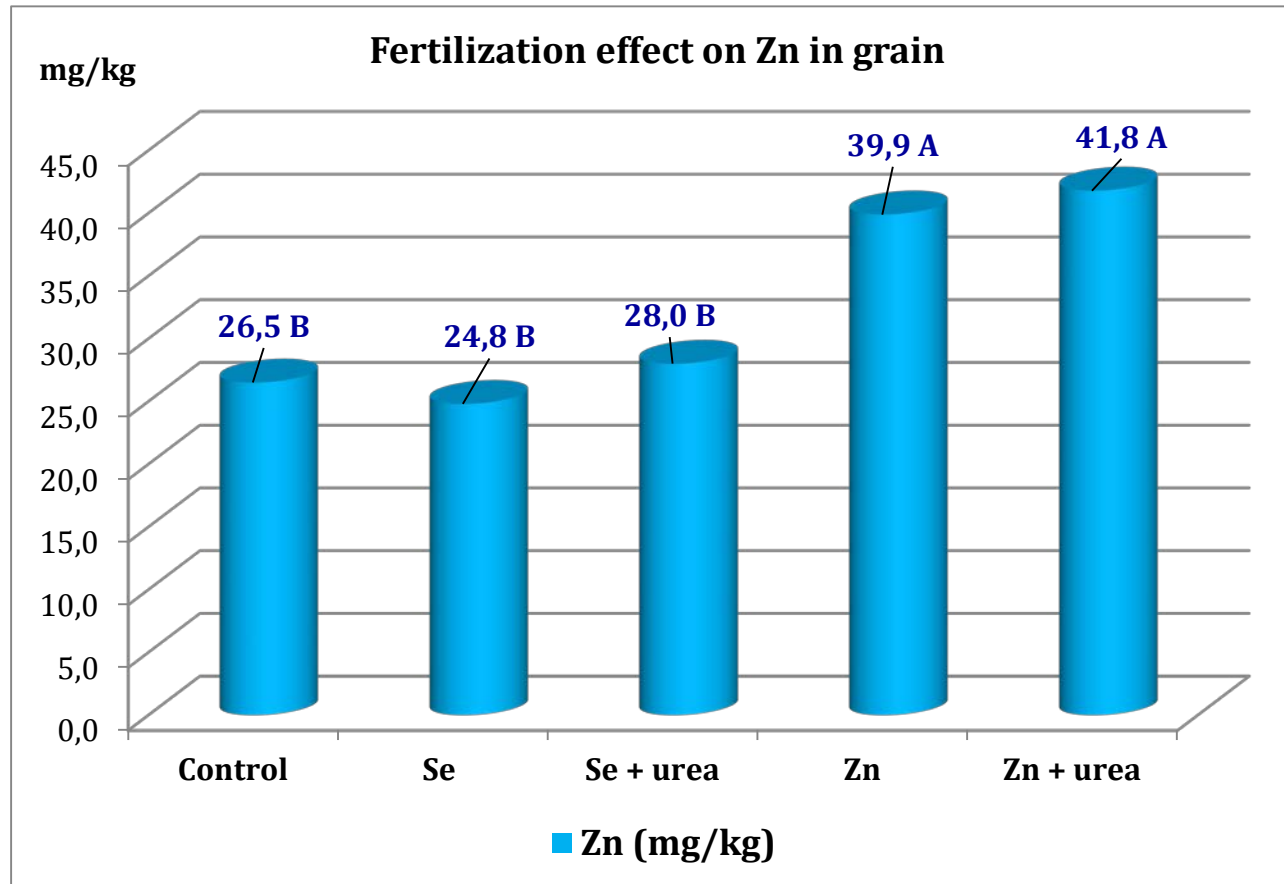


## **Zn in wheat grain – Fertilization effect – 2012-2013**

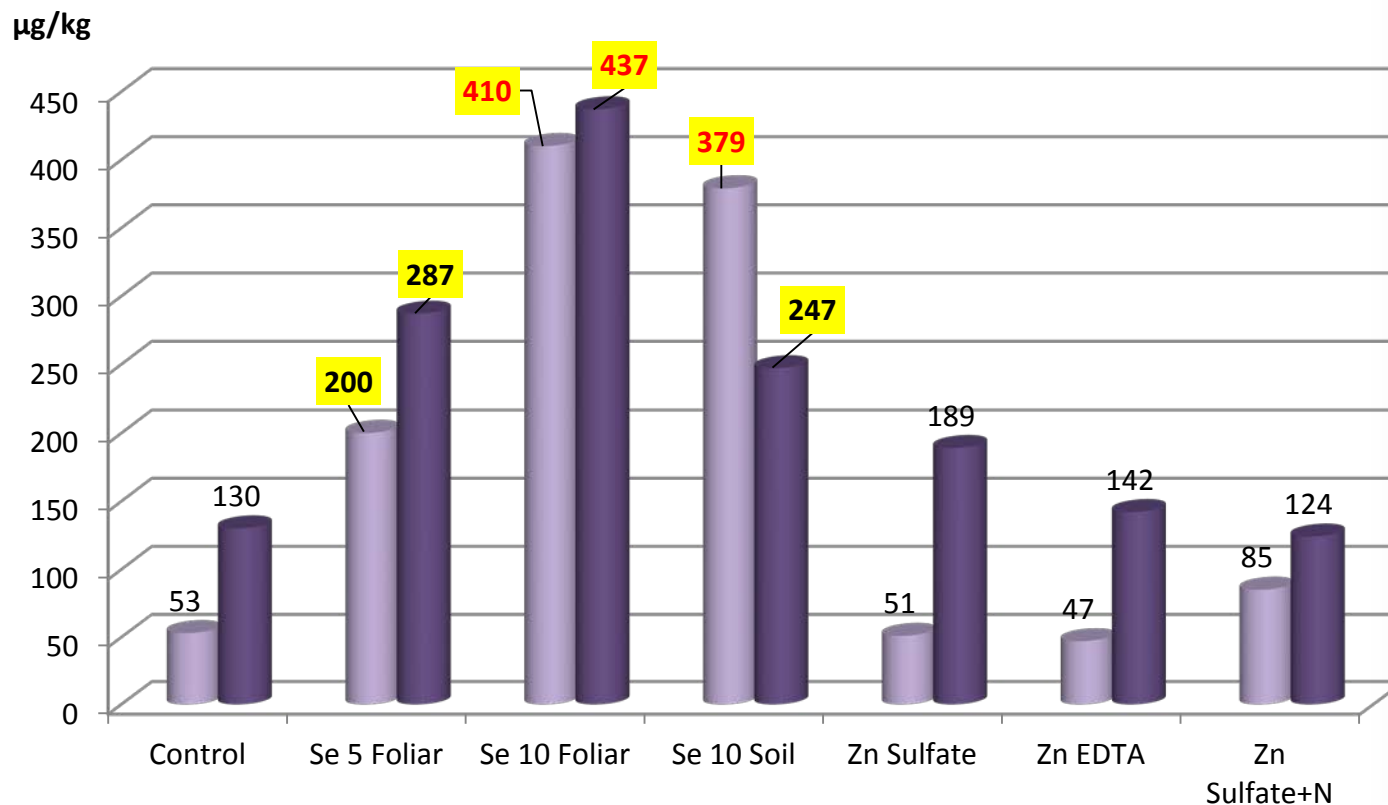
mg/kg



## **Zn in wheat grain – Fertilization effect – 2014-2015**

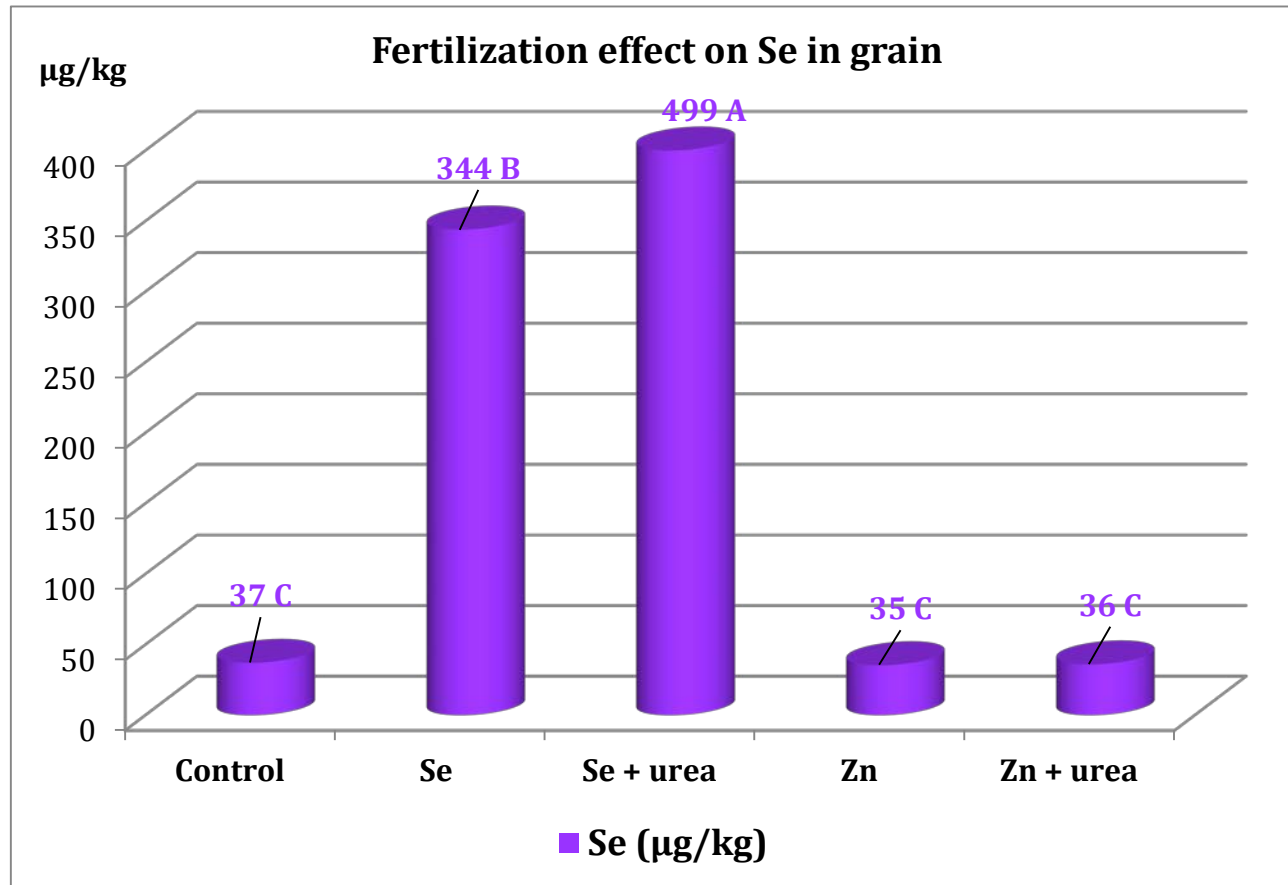


## Se in wheat grain – Fertilization effect – 2012-2013

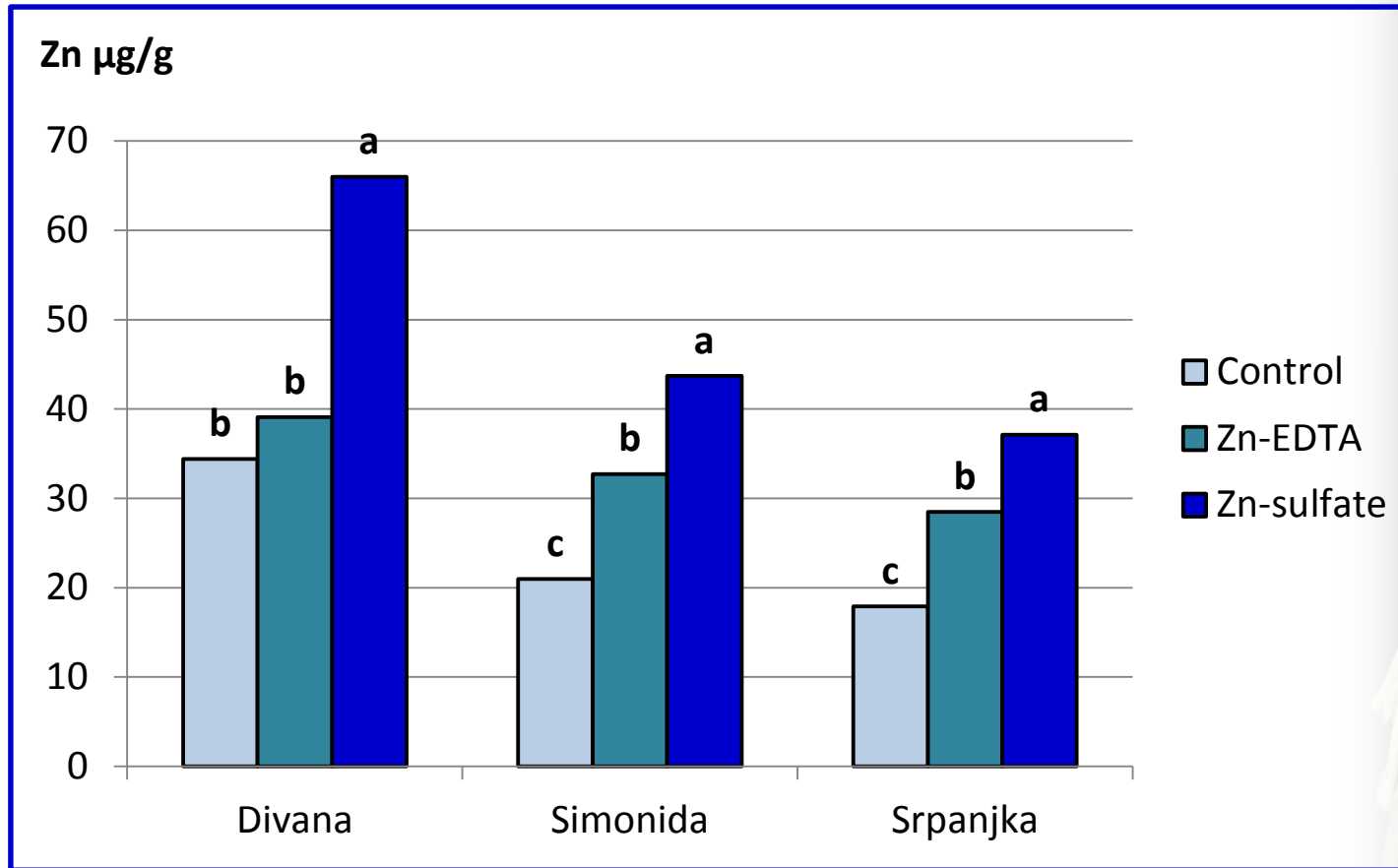




## Se in wheat grain – Fertilization effect – 2014-2015



## Genotype and application effect on Zn concentrations ( $\mu\text{g/g}$ )



- Same effect of Zn on cv. Simonida and cv. Srpanjka, some difference on cv. Divana

## **Conclusions**

1. Wheat grain yield was **NOT affected** by Zn or Se application
2. Se concentrations in wheat grain was **NOT affected by genotype**
3. Zn concentrations in wheat grain **was affected by genotype**
4. Se application resulted in 2,4 -4,7 and 10-fold **higher Se in grain**, depending on season and treatment of applied Se
5. Zn application resulted in **Zn increasing** from 19 mg/kg to 40 and 67 mg/kg in grain, depending on site, genotype and form of Zn

## **Impact on faculties**

- IPA CBC Croatia Serbia project of Faculty of Agriculture in Osijek and Faculty of Agriculture in Novi Sad: „**Agricultural Contribution Towards Clean Environment and Healthy Food**”
- Other applications to IPA&Interreg projects
- Established „**Centre for Applied Life Sciences Healthy Food Chain Ltd. For research and development**” in Osijek



Thank you for your attention.