

# UTJECAJ REDUCIRANE OBRADJE TLA I GNOJIDBE DUŠIKOM NA UROD ZRNA OZIME PŠENICE I SOJE NA HIPOGLEJU BARANJE

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**Stošić, Miro**

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Sveučilište Josipa Jurja  
Strossmayera u Osijeku

**Fakultet  
agrobiotehničkih  
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## UTJECAJ REDUCIRANE OBRADJE TLA I GNOJIDBE DUŠIKOM NA UROD ZRNA OZIME PŠENICE I SOJE NA HIPOGLEJU BARANJE

Miro Stošić, dipl.ing.agr. <sup>(1)</sup>

Disertacija <sup>(2)</sup>

Tijekom trogodišnjega razdoblja (2006./2007. - 2008./2009.) provedena su stacionarna istraživanja reducirane obrade tla za ozimu pšenicu i soju na močvarno-glejnome hidromelioriranome (hipoglej) tipu tla Baranje. Istraživanja su provedena u osam varijantata obrade tla i tri varijante gnojidbe dušikom po split-plot dizajnu u četiri ponavljanja. Obradom tla obuhvaćene su četiri varijante u kontinuitetu za obje kulture: OR-konvencionalna obrada, TR-višekratno tanjuranje, RT-rahljenje i tanjuranje, NT-no-tillage i četiri diskontinuirane varijante: OsTp-konvencionalna obrada za soju, tanjuranje za ozimu pšenicu druge godine, OpTs-konvencionalna obrada za ozimu pšenicu, tanjuranje za soju druge godine, NpOs-no-tillage za ozimu pšenicu, konvencionalna obrada za soju druge godine: NsOp-no-tillage za soju, konvencionalna obrada za ozimu pšenicu druge godine. Gnojdbom dušikom obuhvaćene su tri razine primijenjenog dušika i to za ozimu pšenicu G-1=120, G-2=150 i G-3=180 kg N ha<sup>-1</sup>, a za soju G-1=35, G-2=70 i G-3=110 kg N ha<sup>-1</sup>. Vremenske su prilike tijekom razdoblja istraživanja bile sa značajnim aberacijama 2006./2007. i 2008./2009. (ekstremno sušne godine), dok je 2007./2008. godina bila umjereno vlažna. Ostvareni su visoki i stabilni prosječni trogodišnji urodi ozime pšenice, a visina uroda po varijantama obrade tla smanjivala se redom kako slijedi: RT (7,78) > NsOp (7,75) > OR (7,74) > OpTs (7,62) > TR (7,63) > OsTp (7,58) > NpOs (6,95) > NT (6,92 t ha<sup>-1</sup>), s tim da su na varijantama NpOs i NT ostvareni statistički opravdano manji urodi ozime pšenice u usporedbi s urodima na OR varijanti. Ostvareni su prosječni i relativno stabilni prosječni trogodišnji urodi soje, sa statistički opravdanim razlikama po godina istraživanja, a visina uroda na varijantama obrade tla smanjivala se redom kako slijedi: NpOs (2,62) > OR (2,58) > OsTp (2,56) > NsOp (2,49) > TR (2,46) = RT (2,46) > NT (2,42) > OpTs (2,35 t ha<sup>-1</sup>). Statistički opravdano manji urodi soje, u usporedbi s OR varijantom, ostvareni su samo na varijanti OpTs. Provedenim je istraživanjima utvrđena, uz optimalnu gnojdbu dušikom, vrlo uspješna primjena reduciranih sustava obrade tla u uzgoju ozime pšenice i soje.

Ključne riječi: reducirana obrada tla, gnojdba dušikom, kemijska svojstva tla, otpori tla, ozima pšenica, soja

## INFLUENCE OF REDUCED SOIL TILLAGE AND NITROGEN FERTILIZATION AT WINTER WHEAT AND SOYBEAN GRAIN YIELDS AT BARANYA HIPOGLEY SOIL TYPE

Doctoral thesis

During the three years (2006/2007-2008/2009) stationary research of reduced soil tillage had been conducted for winter wheat and soybean, at marsh gley (hipogley) hydromeliorated soil type of Baranya. The research has been conducted with eight soil tillage treatments and three nitrogen fertilization treatments set up in split-plot design in four repetitions. Soil tillage treatments consisted of four continued soil tillage systems for both crops: OR-conventional soil tillage, TR-multiple diskharroing, RT-chiseling and diskharroing, NT-no-tillage and four discontinued soil tillage systems: OsTp-OR for soybean TR for w. wheat in the forthcoming season: OpTs-OR for w.wheat TR for soybean in the forthcoming season, NpOs-NT for w. wheat OR for soybean in forthcoming season: NsOp-NT for soybean OR for w. wheat in forthcoming season. Nitrogen fertilization treatment had three levels of applied nitrogen: for w.wheat G-1=120, G-2=150, G-3=180 kg N ha<sup>-1</sup> and for soybean G-1=35, G-2=70, G-3=110 kg N ha<sup>-1</sup>. Weather conditions had significant aberrations during 2006/2007 and 2008/2009 (extremely drought seasons), whereas 2007/2008 season was moderately humid. The high and stabile average winter wheat grain yields had been achieved, with statistical difference among years of the research, whereas yield decreased by applied soil tillage systems in the order as follows: RT (7.78) > NsOp (7.75) > OR (7.74) > OpTs (7.62) > TR (7.63) > OsTp (7.58) > NpOs (6.95) > NT (6.92 t ha<sup>-1</sup>), with NpOs and NT treatments recorded significantly lower yields in comparison with OR treatment. According to three year averages, normal and relatively stabile soybean grain yield has been achieved, with significant difference among years, whereas soil tillage systems showed the following decrease order: NpOs (2.62) > OR (2.58) > OsTp (2.56) > NsOp (2.49) > TR (2.46) = RT (2.46) > NT (2.42) > OpTs (2.35 t ha<sup>-1</sup>). In comparison with OR treatment, only OpTs had significantly lower soybean grain yield. The study showed, with the optimum of nitrogen fertilization, a very successful application of reduced soil tillage systems in the winter wheat and soybean production.

Key-words: reduced soil tillage, nitrogen fertilization, winter wheat, soybean, chemical properties

(1) Sveučilište Josipa Jurja Strossmayera u Osijeku/J.J. Strossmayer University of Osijek, Faculty of Agriculture in Osijek, Kralja Petra Svačića 1d, Osijek (mstosic@pfos.hr)

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