

## PRILOG 1.

Znanstveno istraživanje, M. Poljak i suradnici, 2001., Utjecaj područja uzgoja na sadržaj suhe tvari, Grafikon 4. i Grafikon 5.

**Response of potato cultivars (*Solanum tuberosum* L.) to nitrogen fertilization**

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**INTRODUCTION**

Nitrogen is a dynamic and mobile macronutrient, essential for plant growth. It is also nutrient that most often limits yield. Excess, as well as too low nitrogen can reduce potato tuber yield and quality. Cultivars have different requirements and respond differently to applied nitrogen. It is well known that tuberization in potato plants is controlled by environmental and nutrition factors. Most of Croatian potato growers have troubles with low specific gravity and too large or too small tuber size.

**OBJECTIVES**

The aims of this field experiments is:

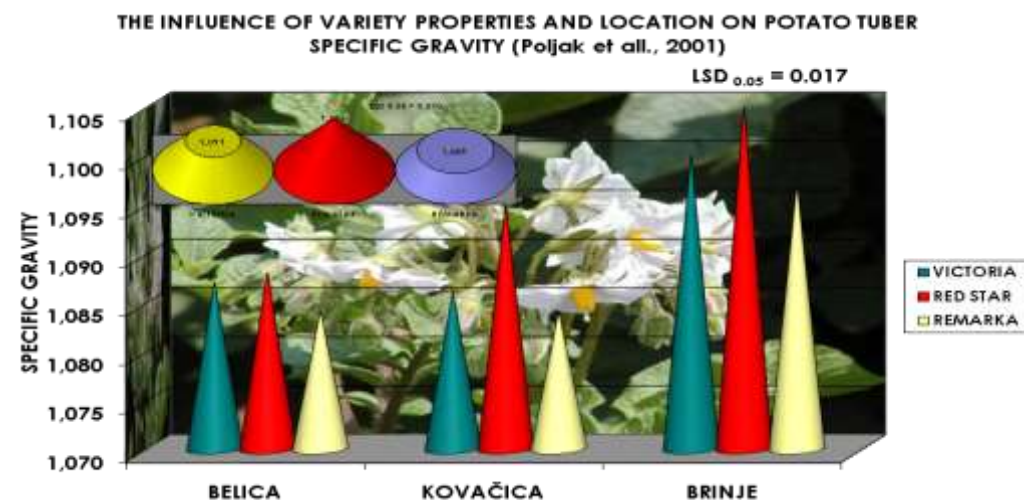
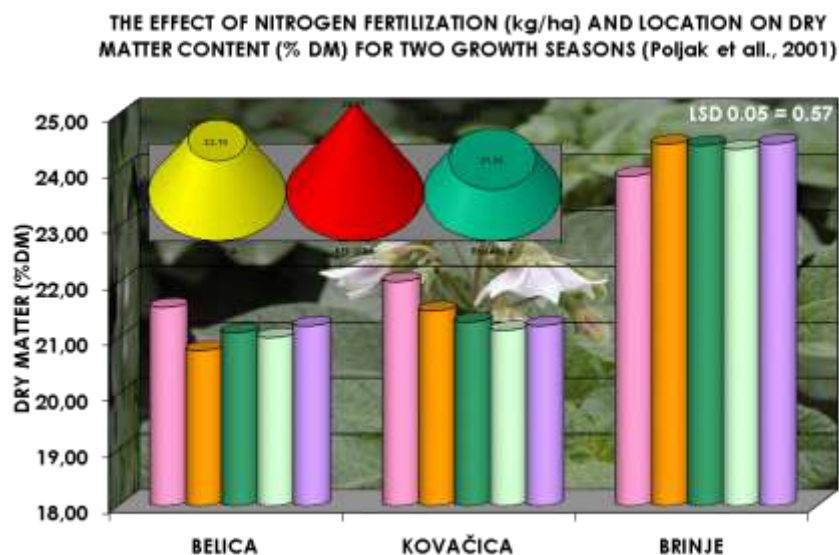
- ❖ to compare responses of cultivars on different levels of nitrogen
- ❖ to find optimal nitrogen levels for achievement good yield and processed or markets quality of potato tubers.

**METHODS**

A series of field experiments at three locations (Belica, Brinje and Slovinska Kovačica) in Croatia during two years (2000 and 2001) were done. All trials were arranged in two factors randomized complete block design with factor B split plot on A. Each block had combinations of three varieties (Victoria, Red Star and Remarka) as main plots (A) and five nitrogen treatments (0, 100, 150, 200 and 250 kg N/ha) as secondary plots (B), replicated three times. Before planting total amount of P<sub>2</sub>O<sub>5</sub> (140 kg/ha) and K<sub>2</sub>O (210 kg/ha) was applied as complex NPK 7-20-30 fertilizer. Nitrogen doses were split and one half of total nitrogen were applied preplanting as complex NPK 7-20-30 fertilizer and KAN 27% N (calcium-ammonium- nitrate). Final nitrogen doses were achieved 45-50 days after planting by application KAN 27% N before ridging. Each experimental plot is 8 rows wide and 10 m long. All trials had standard cultural practices of weed, pest and disease control. Estimation of fresh tuber yield was done by harvesting potatoes from several 3,0 m long sections of three rows per plot and fresh tuber yield per ha was calculated. All tubers from yield estimation

samples were calibrated as: small <35mm, medium 35-55mm and large >55 mm in diameter. At least 5 kg of potato tubers were taken after calibration as samples for tuber quality evaluation. Specific gravity was measured by weight in air, weight in water method and starch yield was calculated. From each sample used for specific gravity measurement ten tubers were used for dry matter determination by drying at 105°C.

Charts 4. 5. Tuber quality



- Different nitrogen fertilization levels did not influence significantly on the dry matter and starch content or specific gravity (Table 1).
- Significant effect on quality parameters had the locations and cultivars, as well as interaction location x cultivar (Chart 4, 5 and 6).
- Red star and Victoria had significantly higher specific gravity, dry matter and starch content then Remarka
- At all locations, in both research years, specific gravity was highest for Red star, then Victoria, and finally Remarka (Chart 5).
- At location Brinje, an increase in specific gravity according to nitrogen fertilization levels was established, and at Kovačica and Belica a decreasing trend was observed.

Experiment factors		%			YIELD	SPECIFIC	%	
		SMALL	MEDIUM	LARGE	(t/ha)	GRAVITY	DM	STARCH
YEAR								
	2000	36	42	22	33,30	1,092	22,36	16,49
	2001	8	22	70	37,32	1,092	22,24	16,52
LOCATION								
	BELICA	14	33	53	41,85	1,087	21,13	15,40
	KOVAČICA	11	35	54	39,99	1,088	21,43	15,73
	BRINJE	40	29	31	24,08	1,101	24,34	18,39
	LSD $p=0.05$	2	4	4	1,70	0,010	0,39	0,38
FACTOR A								
	VICTORIA	20	31	48	36,39	1,091	22,10	16,35
	RED STAR	25	35	40	34,10	1,096	23,27	17,36
	REMARKA	20	30	50	35,43	1,089	21,53	15,81
	LSD $p=0.05$	2	4	4	1,70	0,010	0,39	0,38
FACTOR B								
	N 0	24	34	42	29,52	1,093	22,49	16,75
	N 100	21	31	48	36,23	1,092	22,25	16,48
	N 150	21	30	48	37,00	1,092	22,28	16,48
	N 200	21	32	47	37,39	1,091	22,18	16,36
	N 250	22	32	46	36,39	1,092	22,31	16,48
	LSD $p=0.05$	2	NS	3	1,38	NS	NS	NS