

## **Selection of suitable winter potatoe varieties from imported varieties for summer rice-based field cultivation in Cho Don District, Bac Kan Province, Vietnam**

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### **Objectives**

Use of a large area of summer rice-based fields in fallow of the north region of Vietnam for winter crop could be critical to ensure food security for the region. Winter potatoes cultivation is one of the options, however, the local cultivars which have been used so far are in need to be improved. Therefore, the objective of the study is to select the most suitable potatoes varieties for potatoes production in Cho Don, Bac Kan, Vietnam.

### **Materials and Methods**

An experiment with randomized complete block design to evaluate 8 imported potatoes cultivars from Netherlands was conducted in Na Pai Village, Bang Phuc Commune, Cho Don, Bac Kan in year 2002 and 2003. The experiment was conducted in summer rice-based fields with plot size of 6 m<sup>2</sup> and potatoes density of 6 plants m<sup>-2</sup>. Potatoes was planted on 15 October and was fertilized with 10 tons of manure, 100: 100: 100 kg N, P<sub>2</sub>O<sub>5</sub>, and K<sub>2</sub>O, respectively. Number of main braches per plant, leaf area index (LAI), growth index (9 steps where 1 and 9 were the worst and the best, respectively) were measured in 50 days after planting (DAP). Plant height, yield and yield components were observed at harvest. Collected data were analyzed by ANOVA using SAS 8.1.

### **Results and Discussion**

Table 1 indicates that most of the growth parameters of evaluated cultivars were lower in year 2003 than those in year 2002, possibly due to low rainfall of winter season in year 2003. No significant differences of number of main branches were detected among cultivars. However, other parameters, plant height, LAI and growth index, were significantly different among cultivars. The cultivars have high growth parameters such as Bakara, Sinara, and Fontane (high plant height), Satana and Marlen (high LAI and consistently high over 2 years). In general, most of the cultivars had low leaf areas index if plant density was 6 plant m<sup>-2</sup> as designed in this experiment. Therefore, additional study on plant density and other management methods for improvement of LAI should be conducted for efficient potatoes production. Based on potatoes growth parameters, two cultivars, Satana and Marlen, were the most promising.

Yield and yield component measurements indicated that Satana and Marlen had high number of harvested plants per plot, number of tubers per plant and tuber weight and yield (ton ha<sup>-1</sup>) compared to the other cultivars. In contrast, Radstar cultivar had the lowest parameters, due to high pest and disease infectation. The yield in year 2003 was lower than that in year 2002, however, it was much higher than average yield of Vietnam in the same years (about 10 ton ha<sup>-1</sup>).

In conclusion, two potatoes cultivars Satana and Marlen were recommended for winter potatoes production in Cho Don District, Bac Kan Province, Vietnam.

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Table 1. Growth variables of 8 imported potatoes cultivars in winter crop year 2002 and 2003 in Cho Don, Bac Kan, Vietnam

Cultivar	Number of main stems per plant		Plant height <sup>s</sup> (cm)		LAI (m <sup>2</sup> m <sup>-2</sup> )		Growth index (point)	
	2002	2003	2002	2003	2002	2003	2002	2003
Diamant	3.4	3.1	60.1abc	58.7ab	2.7cd	2.6c	7.3abc	7.7abc
Baraka	3.7	3.8	70.0a	65.9a	2.9abc	2.8bc	7.3abc	7.0cde
Sinora	3.5	3.4	68.0ab	64.3ab	2.8bc	2.6c	7.0bc	6.3de
Marlen	3.2	3.0	63.9abc	61.4ab	3.2ab	3.1ab	8.7ab	8.3ab
Redstar	3.3	3.2	56.9c	56.7b	2.4d	2.1d	6.0c	6.0e
Redone	3.5	3.5	63.4abc	60.2ab	3.1ab	2.9abc	7.7abc	7.3bcd
Satana	3.9	3.7	58.7bc	59.0ab	3.3a	3.2a	9.0a	8.7a
Fontae	2.9	2.7	68.4ab	65.1ab	2.7cd	2.9abc	6.7c	6.7cde
CV%	12.34	12.78	9.56	8.03	9.38	7.20	13.41	10.26
LSD <sub>0.05</sub>	ns	ns	10.66	8.63	0.42	0.35	1.75	1.30

<sup>s</sup>Treatments followed by different letters were significantly different at P<0.05.

Table 2. Yield and yield components of 8 imported potatoes cultivars in winter crop year 2002 and 2003 in Cho Don, Bac Kan, Vietnam

Cultivar	Number of harvest plants per plot <sup>s</sup>		Number of tubers per plant		100-tuber weight (g)		Yield (ton ha <sup>-1</sup> )	
	2002	2003	2002	2003	2002	2003	2002	2003
Diamant	33.3a	31.7ab	9.1a	8.8a	4725	4461	18.77ab	17.12b
Baraka	30.0a	27.7bc	8.1ab	8.2ab	4980	4530	20.64ab	18.74ab
Sinora	32.0a	32.3ab	7.9abc	7.6ab	5070	4948	20.27ab	19.37ab
Marlen	32.7a	33.3ab	8.2ab	8.0ab	5560	5279	22.50a	21.46ab
Redstar	24.3b	22.7c	7.0bc	7.2bc	4889	4523	12.38c	11.53c
Redone	31.7a	28.3abc	8.4a	8.1ab	4750	4613	20.44ab	18.62ab
Satana	34.7a	35.3a	6.5c	6.3c	6667	6517	22.77a	21.95a
Fontae	31.3a	28.7abc	8.7a	8.1ab	3951	3992	17.94b	17.51b
CV%	10.29	13.82	10.04	9.21	-	-	11.90	12.30
LSD <sub>0.05</sub>	5.69	7.30	1.40	1.25	-	-	4.06	3.95

<sup>s</sup>Treatments followed by different letters were significantly different at P<0.05.