

Comparative studies of some new potato cultivars and their morphological characteristics

J. MOHAMMADI^{1*}, S.A. KHASMAKHI-SABET¹, J.A. OLFATI²,
A. DADASHPOUR³, J. LAMEI⁴ and B. SALEHI¹

¹Azad University, Abhar branch, Horticultural department, Abhar (Iran)

²University of Guilan, Horticultural Department, Rasht (Iran)

³Tehran University, Horticultural department, Karaj (Iran)

⁴Zanjan University, Horticultural department, Zanjan (Iran)

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ABSTRACT

Potato is not an indigenous crop of Iran but both red and white skinned potatoes are commonly grown. Present study was conducted to screen few potato varieties received from national breeding program and to evaluate them for recommending the cultivation of the best selected variety. Ten varieties i.e. Finna, Kondor, Ditta, Romano, Bright, Picaso, Santa, Marfona, Bolesta and Cosmos achieved from breeding program with control Agría were tested for their vegetative and morphological characteristics under local conditions. It was found that the cultivar Finna superseded all other cultivars with regard to growth and suitable morphological characteristics. The cultivars Kondor also appeared to be promising for adoption in future.

Key words: Potato, morphological characteristics, breeding program, cultivars.

INTRODUCTION

The potato (*Solanum tuberosum* L.) is an annual, cool season plant belonging to *Solanaceae* family. Potato is an important vegetable crop throughout the world. Potato gives higher production even than wheat and rice and at the same time its nutritional value is superior than most of the food crops. It is the richest source of carbohydrates. The potato has good nutritional value. One medium sized potato (about 1/3 pound) supplies 35% of the U.S. recommended daily allowance of Vitamin C, 6% protein, and 10% iron, as well as other vitamins and minerals, yet only has 100 calories.

Both red and white skinned potatoes are commonly grown. Other colors, including blue, pink, and yellow, are also naturally occurring, but seldom grown. Optimum yields of potatoes are achieved during a long, cool growing season. The edible

portion of the plant, the tuber, is an underground modified stem structure; the "eyes" are the buds which sprout shoots.

Potato is not an indigenous crop of Iran. Since potatoes are propagated vegetatively, the seed tubers are the major source of survival of different diseases (Akius and Kloos 1990). Farmer's practices further accelerated infection of seed stocks as they generally used smaller (Bhomi and Kloos 1991) and leftover tubers as seed.

Cultivar selection is very important for growers trying to market quality product. Estevez et al. (1982) studied the factors affecting tuber yield in eight potato cultivars. They observed that the number of tubers per plant, average tuber weight and plant height were most closely related to tuber yield. Estevez (1982) studied tuber yield of seventeen potato varieties from Canada, France,

Holland and Germany. The cultivars with the heaviest tuber weight gave the best yield and had the lowest number of tubers per plant. Jablouski (1990) reported that tubers of potatoes cv. Ronda and Sowa were planted at three depths, deeper planting increased number of days to emerge but had no effect on maturity date. Ronda gave higher seed tuber yield than Sowa. Bisen and Barholia (1991) tested cultivars of potato for various parameters of growth. They found that among 8 varieties of potato, the Kufri and Joyti were the highest yielding varieties (32.5 and 29.7 tonnes/ha). Keeping in view the above factors, present project was undertaken to evaluate different potato cultivars in terms of their growth and morphological parameters.

MATERIAL AND METHODS

Eleven new release cultivars obtained from different breeding program of the country (Table 1) were evaluated at the Potato Research Farm, Abhar, Azad University. Potato cultivars were planted in 3.6 m² plot size in three replications. The soil type was a loamy-sand and rainfall was supplemented with overhead irrigation as needed. Chemical fertilizers were applied at the rate of 100:100:60 kg ha⁻¹ NPK. Spacing was maintained at 60 cm as row to row and 25 cm as plant to plant. Observations were made and the data on morphological characteristics were recorded. Following data were recorded: number of branches per plant, plant height, days to

flowering, skin color and resistant to some diseases. In order to study the above mentioned characters, five plants were randomly selected from each treatment. The experiment was designed in accordance with randomized complete block design and differences among treatment means were compared by tukey test at 5% probability.

RESULTS AND DISCUSSION

Table 1 reveals that out of various vegetative characters studied, differences in plant height, number of branch per plant, days to flowering were found significant. Finna, gave the shortest days to flowering. It was followed by Agria and Kondor. Minimum plant height was observed in Finna. Maximum number of branches per plant were observed in Kondor and Bolesta. Minimum number of branches was observed in Santa. In term of skin color except of Kondor and Romano all cultivar have white skin. Our more research on disease resistance and other characteristics listed in table 2-8 and can be used depending on local field condition. It was found that the cultivar Finna superseded all other cultivars with regard to growth and suitable morphological characteristics. The cultivars Kondor also appeared to be promising for adoption in future. Romano, Picaso and Finna Resulted the highest storage ability and in other hands Bright and Finna showed the highest dry matter percent and can be used in processing industries.

Table 1: Vegetative and morphological characteristics of potato cultivars

Cultivar	Plant height (cm)	Number of main branch	Days to flowering	Skin color
Finna	52	3.75	50	white
Kondor	51	5.25	52	Red
Ditta	58.75	4.75	59	white
Romano	52	4.5	53	Red
Bright	50.25	4	58	white
Picaso	52.75	3.5	59	white
Santa	69.5	3.25	60	white
Marfona	53	3.5	60	white
Bolesta	48.5	5	53	white
Cosmos	55.25	3.5	58	white
Agria	70.25	3.75	51	white
Mean	55.25	4.07	55.72	-

Table 2- Ditta (BintgexQuarta) Characteristics



	<p>Early to intermediate, intermediate to late</p>	<p>maturity</p>
	<p>Medium-long to long good Dark yellow yellow Long to oval shallow large high medium</p>	<p>Dormancy period Foliage cover Tuber skin colour Tuber flesh colour Tuber shape Tuber eye depth Tuber size Yield potential Dry matter content Cooking type</p>
	<p>Firm to Fairly firm Medium to high Very high high Low Medium to high high high high</p>	<p>Resistance to leaf roll virus Resistance to Virus A Resistance to Virus Yn Resistance to late blight on foliage Resistance to late blight on tuber Cyst nematode Ro1 resistance to common Scab Resistance to internal bruising</p>

Table 3:Agria (Quartax Semle) Characteristics



	<p>Early to intermediate</p>	<p>maturity</p>
	<p>long good yellow yellow Long to oval shallow large high high Fairly firm medium Very high high Low to medium Medium to high high low Medium to high</p>	<p>Dormancy period Foliage cover Tuber skin colour Tuber flesh colour Tuber shape Tuber eye depth Tuber size Yield potential Dry matter content Cooking type Resistance to leaf roll virus Resistance to Virus A Resistance to Virus Yn Resistance to late blight on foliage Resistance to late blight on tuber Cyst nematode Ro1 resistance to common Scab Resistance to internal bruising</p>
		

Table 4: Kondor (61333 wilja) characteristics



	Intermediate, intermediate to late	maturity
	long	Dormancy period
	good	Foliage cover
	red	Tuber skin colour
	yellow	Tuber flesh colour
	Long to oval	Tuber shape
	Medium to deep	Tuber eye depth
	Very large	Tuber size
	high	Yield potential
	low	Dry matter content
	Fairly firm	Cooking type
	medium	Resistance to leaf roll virus
	Very high	Resistance to Virus A
	medium	Resistance to Virus Yn
	medium	Resistance to late blight on foliage
	Medium to high	Resistance to late blight on tuber
	high	Cyst nematode Ro1
	low	resistance to common Scab
	high	Resistance to internal bruising

Table 5: Marfona (primura kotts1-12) characteristics



	Early to Intermediate, intermediate to late	maturity
	long	Dormancy period
	good	Foliage cover
	yellow	Tuber skin colour
	yellow	Tuber flesh colour
	Long to oval	Tuber shape
	shallow	Tuber eye depth
	Very large	Tuber size
	Very high	Yield potential
	Low to very low	Dry matter content
	Firm to Fairly firm	Cooking type
	low	Resistance to leaf roll virus
	high	Resistance to Virus A
	Medium to high	Resistance to Virus Yn
	Low to medium	Resistance to late blight on foliage
	Medium to high	Resistance to late blight on tuber
	high	Cyst nematode Ro1
	low	resistance to common Scab
	Medium to high	Resistance to internal bruising

Table 6: Mondial (Spunta´SVPVe 66295) characteristics



	intermediate to late, late	maturity
	long	Dormancy period
	good	Foliage cover
	yellow	Tuber skin colour
	yellow	Tuber flesh colour
	oval	Tuber shape
	medium	Tuber eye depth
	large	Tuber size
	Very high	Yield potential
	Medium to low	Dry matter content
	Fairly firm	Cooking type
	low	Resistance to leaf roll virus
	high	Resistance to Virus A
	Medium to high	Resistance to Virus Yn
	Low	Resistance to late blight on foliage
	Medium	Resistance to late blight on tuber
	high	Cyst nematode Ro1
	medium	resistance to common Scab
	Medium to high	Resistance to internal bruising

Table 7: Picasso (carax´ausonia) characteristics



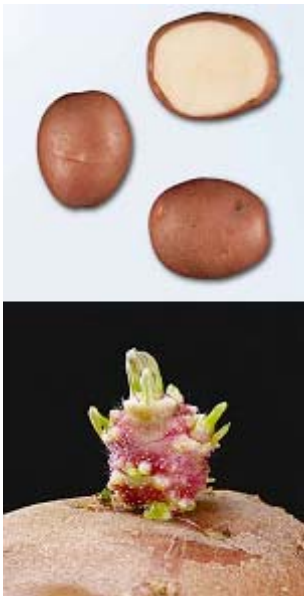
	Early to intermediate, intermediate to late	maturity
	Long to very long	Dormancy period
	Very good to good	Foliage cover
	Yellow with red eye	Tuber skin colour
	yellow	Tuber flesh colour
	oval	Tuber shape
	Shallow to medium	Tuber eye depth
	Very large to large	Tuber size
	Very high	Yield potential
	low	Dry matter content
	Fairly firm	Cooking type
	Low to medium	Resistance to leaf roll virus
	high	Resistance to Virus A
	Medium to high	Resistance to Virus Yn
	Low to medium	Resistance to late blight on foliage
	Medium to high	Resistance to late blight on tuber
	high	Cyst nematode Ro1
	Medium to high	resistance to common Scab
	Medium to high	Resistance to internal bruising

Table 8: Romano (Draga Destivec) characteristics

	Early to intermediate	maturity
	Long	Dormancy period
good to medium	red	Foliage cover
Yellowish with	Round to oval	Tuber skin colour
medium	medium	Tuber flesh colour
medium	high	Tuber shape
Fairly firm	medium	Tuber eye depth
Low to medium	high	Tuber size
Medium to high	medium	Yield potential
Medium to high	high	Dry matter content
Low to medium	medium	Cooking type
Medium to high	Low to medium	Resistance to leaf roll virus
Low to medium	Medium to high	Resistance to Virus A
Medium to high	high	Resistance to Virus Yn
high	Medium to high	Resistance to late blight on foliage
Medium to high	high	Resistance to late blight on tuber
Medium to high	Medium to high	Cyst nematode Ro1
Medium to high	Medium to high	resistance to common Scab
	Medium to high	Resistance to internal bruising

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