

Study on Some Agronomic Traits in Advanced Potato Cultivars and Clones in Ardabil

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Abstract: In order to evaluate some agronomic traits in potato varieties and advanced clones in Ardabil field experiment in 2015 in Agriculture and Natural Resources Research Station of Ardabil carried out to evaluate some agronomic traits in advanced potato cultivars and clones in Ardabil. This test with 7 advanced medium clone late and three witnesses of Agria, Marfona and Savalan total of 10 clones and the figure was based on a randomized complete block design with three replications. In this study, plant height, number of main stems, number of tubers per plant, tuber weight per plant, total tuber yield and marketable tuber yield were evaluated. The results showed that between clones and cultivars except number of main stems per plant for all traits, there are significant differences in levels 1 and 5% probability. This suggests genetic variation between clones and cultivars in order to select for the traits considered. Among the characteristics, the number of tubers per plant and plant height by 8.21 percent to 8.20 percent, the most had the lowest coefficient of variation. Tuber yield (clone 3) than the control varieties and cultivars Marfona and Savalan 21.78 and 15.03 percent increase respectively. In other words, normal operation is relatively good. Agria cultivar (control) with an average of 43.15 tons per hectare, with the remaining difference was statistically significant and clone No. 1 (HS95-1) with an average of 25.95 ha lowest among clones and cultivars had the gland. So tuber yield than the parent parental clone No. 10 increased by 9.57 and 23.51 percent in other words, tuber is normal and good. Agria cultivar (control) with an average of 39.12 tons per hectare, with the remaining difference was statistically significant and clones No. 1 (HS95-1) with an average of 20.54 tons per hectare least marketable tuber yield clones and cultivars among themselves.

Keywords: potato, total tuber yield, advanced varieties and clones

conditions for the cultivation of this product is limited. Due to population growth and subsequent demand for an ever-increasing need for food, including potato and potato processing plants that are suitable for processing (crisps and over), and have also acceptable performance only to respond to the needs of a variety with high yield and better quality. Thus, evaluation of potato varieties in terms of quantity and quality of research priorities that is essential for cold regions (Hassanpanah et al, 2008). Potato is one of the most important crops in the region Ardebil, Ardebil plain with an area of about 85 hectares; the land is fertile and potentially located in northern Iran and is part of the catchment area of the river sediments of the Caspian Sea. Potato is one of the most important crops and the importance of food and the production of wheat and rice have (Upadhyya et al., 1996). The introduction of new varieties has economic value through high sales performance and provides sustainable low production cost. New varieties resistant to pests and diseases should be introduced to reduce the use of chemicals and thereby reduce the environmental damage (Ross, 1986).

Introduction

Potato is the world's most important type of agriculture for food production. It is grown in more than 160 countries. One of the products that is potato tuber and bulb has been on high carbohydrate and plays an important role in feeding the world and because of its very high yield per hectare, is of great concern. So that the grains in equal proportions of protein and carbohydrates produces nearly twice as much per hectare. This gland economically valuable plant and continues to feed humans and livestock or produce starch usage is high (Hosseinzadeh, 2001). The potato is the third most important food crop after wheat and rice in our country. The need for the basic product in no doubt that after the grain has been of secondary importance and partly replaces wheat bread and with most foods is important in human nutrition. In addition, because many people in the world in terms of planting, growing and transforming the food industry and other industrial products, transportation and sales work and to make a living, is also important in economic terms (Pazhouhandeh, 2001).

Potato cultivation in the country because of dehydration and the need for special environmental

that can withstand short-day (Hassanpanah and Hosseinzadeh, 2000). Studies conducted in conjunction with morph physiological traits and their relationship with yield and determine the heritability showed that sales performance has direct effect and indirect effect on most edible tubers per hectare yield. The highest heritability of traits is related to the depth of the eyes, flesh color, bulb shape, number of main stem, flowering maturity date (Mousapour Gorji, 2005). The aim of this study was to Study on Some Agronomic Traits in Advanced Potato Cultivars and Clones is in Ardabil.

Materials and Methods

The field experiment was conducted in 2015 in Ardabil Agricultural Research Station and natural resources. Ardabil terms of geographic coordinates in latitude 38 degrees 15 minutes north and longitude 48 degrees 15 minutes East is located. Also, because of the very cold winter and mild spring and summer and be at the height of 1350 meters above sea level and an average annual rainfall of 400 mm has provided good conditions for the cultivation of potatoes. 7 advanced medium test clone late and three witnesses Agria, Marfona and Savalan total of 10 clones and cultivars based on randomized complete block design with three replications. View cultivars and clones are shown in Table 1. Each clone and the two riffs to length of 5 meters and the distance between the two plants between rows 25 and 75 in the culture. Crop care for all treatments during the implementation of uniform tests was performed. To fight the Colorado beetle pest poison Imidaclopride and for the prevention of disease downy mildew of Mancozeb poison was used. In this study, plant height, number of main stems, number of tubers per plant, tuber weight per plant, total tuber yield and tuber yield were evaluated data from measurements of traits using software SAS901 analysis of variance done and means comparison by Duncan will be compared with each other. The correlation between the traits will be done with SPSS software. Charts will be drawing EXCEL software.

Mousapour Gorji (2005) heritability of traits by examining 44 gluon potato flesh color, skin color, tuber shape, depth eyes and the tuber dry matter content of tuber dry matter production per unit area, respectively, 94, 69, 97 , 98, 68 and 75 per cent were reported. The rate of heritability for number and diameter, maturity and flowering were 91, 76, 91 and 90%, respectively, for total yield, marketable yield and the yield of edible size, seed and other seed 73 respectively, 87, 79, 81 and 76 per cent were reported. Hassanabadi (2004) by assessing the qualities of potatoes in Europe, 99 198 commercial cultivars and clones breeding program were evaluated using ratings from 1 to 9. Although all national and international centers traits ratings based on their assessments, however, little practical guidance on how to rank the resources are available. Hassanpanah and Hosseinzadeh (2003) 200 selected clones were studied for three years in Ardabil and finally 5 superior clones were selected. The five selected clones, four clones of the parents were TPS67 × ATZIMBA. Hassanpanah (2004) family of seven true potato seed crop collected from the Research Institute of Agriculture and Natural Resources Research Station in Ireland and Ardabil total of 2400 selected clones. The results showed that within any family traits leaf shape, color, flower color, plant type, there are a variety of meat and skin color. Hassanpanah and Hosseinzadeh (2000) of 5 new progeny true potato seed during two years in Ardabil 200 clones were selected and to continue to introduce superior clones of the colony selection method was used. It should be noted development ambient temperature, affecting the potato crop and the most appropriate day temperature for growth of 18 to 20 ° C and 15 ° C for the night. Soil temperature below 10 and above 30 ° C severely prevents tumor formation and the best temperature for tumor induction is 15. Early potatoes into two groups (120 to 90 days) and late (150 to 180 days) is classified. Early varieties suitable for temperate regions during the day 15 to 17 hours of need. While the short-day and long-day varieties produced under good late. In tropical regions consistent and successful varieties

Table 1. Varieties and clones studied

| Nom | name | Nom | name |
|---------|---------|---------|--------|
| 1 | Agria | clone 3 | H295-3 |
| 2 | Marfona | clone 4 | H295-4 |
| 3 | Savalan | clone 5 | H295-5 |
| clone 1 | H295-1 | clone 6 | H295-6 |
| clone 2 | H295-2 | clone 7 | H295-7 |

differences in levels 2 and 5% probability. This suggests genetic variation between clones and cultivars in order to select for the traits considered. Mojtahedi (2013) reported that among the studied hybrids for all traits there are significant differences

Analysis of variance

The results of the data analysis are presented in Table 3 traits. The results showed that between clones and cultivars except number of main stems per plant for all traits, there are significant

plant height by 8.21 percent to 8.20 percent, the most had the lowest coefficient of variation. Average clones and cultivars using LSD test at the 5% level were compared.

in the level of 1%. Poorsoleiman (2014) reported that between clones and cultivars except the main stem diameter for all traits, there are significant differences in levels 1 and 5% probability. Among the characteristics, the number of tubers per plant and

Table 2. Analysis of variance study

| S.O.V | df | Mean of Square | | | | | |
|-------|----|----------------|--------------------------------|----------------------------|------------------------|-------------------|------------------------|
| | | plant height | number of main stems per plant | Number of tubers per plant | tuber weight per plant | Total tuber yield | marketable tuber yield |
| Rep | 2 | 39 | 1.001 | 31.116** | 35345.21* | 99.286* | 39.754 |
| Gen | 9 | 244.88* | 2.96 | 6.364* | 32118.14** | 93.059** | 104.975** |
| Error | 18 | 30 | 2.012 | 3.062 | 7420.819 | 20.848 | 20.497 |
| C.V% | | 8.21 | 16.18 | 20.8 | 12.20 | 13.27 | 15.19 |

* and ** Significantly at $p < 0.05$ and < 0.01 , respectively

affect Yield and this means that although the number of tubers great impact on performance, but this effect is applied by weight. Weight tubers Agria cultivar (control) with an average of 814.17 g with other significant difference with Savalan and clones 3, 6 and 7 were in a group and the clone No. 1 (HS95-1) with an average 489.59 grams minimum weight of tubers between clones and cultivars, respectively (Table 3).

Total tuber yield

In total tuber yield, according to the indicator "percentage compared to control yield" reasonable and uniform criteria for comparison provides materials were used. The absolute performance from region to region and from year to year is different. Tuber yield (clone 3) increase than the control Marfona and Savalan 21.78 and 15.03 percent, respectively, in other words, normal operation is relatively good. Agria cultivar (control) with an average of 43.15 ha with other significant difference with Savalan and clones 3, 6 and 7 were in a group and the clone No. 1 (HS95-1) with an average of 25.95 tons per hectare, the highest tuber yield between clones and cultivars, respectively (Table 3). Poorsoleiman (2014) reported that the gland clone 7 (2-397008) with an average of 57.81 tons per hectare, the highest and the Lady Rosetta (control), with an average of 34.27 ha had the highest tuber yield

Marketable tuber yield

Clone yield No. 10 has increased performance compared to two parent family and female parent respectively, 9.57 and 23.51 percent tuber i.e. normal and is relatively good. Agria cultivar (control) with an average of 39.12 ha with other significant difference with Savalan and clone 3 and 7 were in a group and the clone No. 1 (HS95-1) with an

Plant height

Agria cultivar plant height control with an average of 81.05 cm, with other significant differences with the clone No. 1 (HS95-1) were in a class and clone No. 4 (HS95-4) with an average of 52 cm minimum plant height between clones and cultivars themselves and with the clone No. 3 (HS95-3) were in class f (Table 3). Rezazadeh (2006) showed that in the study of traits, plant height at the 1% level, there are significant differences. Fathi (2004) showed that the traits that influence tuber yield, plant height is significant at 1%. Shekari (2007) reported on a study of eight varieties of potatoes that the difference between the figures in terms of plant height was significant at 5% level. Mojtahedi (2013) in a study conducted on 20 hybrid potato plant height was reported that there are significant differences among hybrids at 1%. Barghi (2013) investigated the genetic variation for quantitative and qualitative characteristics of varieties of potato genotypes of radiation Kenebek announced that there are significant differences between varieties in plant height at 1%.

Number of tubers per plant

The Number of tubers per plant clones 6 and 7 (HS95-6 and HS95-7) respectively in the 10.59 and 10.54 had a significant number of other clones with Agria two cultivars (varieties control), and clones No. 3, 4 and 5 were in a class Savalan control and clone No. 1 (HS95-1), respectively, with an average of 6.71 and 6.67 lowest Number of tubers per plant in between clones and cultivars, respectively (Table 3).

Tuber weight per plant

Although some researchers, the number of tubers per plant and the weight of the tumor in the gland knows better (Fathi, 2004). It should be noted that the number of tubers through the weight that

and hybrid 64.98 No. 6 with an average of 27.26 tons per hectare least marketable tuber yield between hybrids, respectively.

average of 20.54 tons the tuber yield per hectare between clones and cultivars, respectively (Table 3). Mojtahedi (2013) reported that sales of hybrid tuber yield 10 tons per hectare, with an average maximum

Table 3. Average traits with F of significant

| Name | Traits | | | | | | | | | |
|--|-------------------|-----|----------------------------|-----|-----------------------------|------|----------------------------|------|---------------------------------|-----|
| | plant height (cm) | | Number of tubers per plant | | tuber weight per plant (gr) | | Total tuber yield (ton/ha) | | marketable tuber yield (ton/ha) | |
| Agria | 81 | a | 8.17 | abc | 814.17 | a | 43.15 | a | 39.12 | a |
| Marfona | 65 | cde | 8.51 | abc | 613.65 | c-f | 32.52 | c-f | 27.39 | cde |
| Savalan | 69 | cd | 6.71 | c | 666.67 | a-e | 35.33 | a-e | 32.41 | abc |
| H295-1 | 79 | ab | 6.67 | c | 489.59 | f | 25.95 | f | 20.54 | e |
| H295-2 | 66 | cde | 7.53 | bc | 536.87 | ef | 28.45 | ef | 24.43 | de |
| H295-3 | 58 | ef | 9.87 | ab | 784.58 | ab | 41.58 | ab | 37.39 | ab |
| H295-4 | 52 | f | 7.7 | abc | 553.13 | def | 29.31 | def | 23.95 | de |
| H295-5 | 63 | cde | 7.81 | abc | 638.54 | bcde | 33.85 | bcde | 29.65 | bcd |
| H295-6 | 72 | bc | 10.59 | a | 590.32 | abcd | 36.58 | abcd | 31.08 | bcd |
| H295-7 | 62 | de | 10.54 | a | 705.01 | abc | 37.36 | abc | 32.28 | abc |
| Differences between averages of each column which have common characters are not significant at probability level of 5%. | | | | | | | | | | |

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