



شبكة المعلومات الجامعية

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شبكة المعلومات الجامعية
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شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of
15-25- c and relative humidity 20-40%

بعض الوثائق الأصلية تالفة

بالرسالة صفحات لم ترد بالاصل

**EFFECT OF DIFFERENT METHODS OF
VEGETATIVE PROPAGATION ON YIELD AND
QUALITY OF POTATO UNDER SANDY SOIL
CONDITIONS**

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By

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APPROVAL SHEET

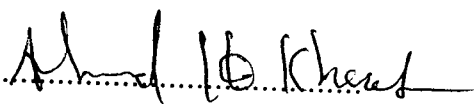
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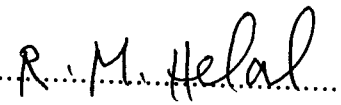
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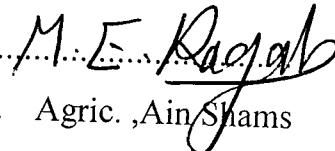
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1.INTRODUCTION

Potato(*Solanum tuberosum*) is considered as one of the most economical and important vegetable crops in Egypt . Total area planted with potato was 62244 fed. in the winter season of 1998/99 with an average yield of 10.1 ton/fed. , 73473 fed. in the autumn season with an average yield of 8.3 ton/fed. and 71813 fed. in the summer season with an average yield of 10.3 ton/fed. *

The yield of this area is used for the local market , processed or exported to different countries .

There are different plant materials used in potato planting *E.g.* imported , local produced seed, tissue culture products .

Growers cultivate autumn season with local produced seeds but its yield is not valid to be used as seed source because in this time the virus translators such as white fly and other insects are active . Winter season is normally cultivated with local produced seeds but its yield is harvested after the summer season cultivation date. The summer season is cultivated with imported seeds or local produced seeds but the local one is old in its physiological age because of its long storage period from the previous season .

Imported seeds are almost expensive as compared with the local seeds. In a wide area the growers cut the tubers into seed pieces to minimize the cost . On the other hand, they cultivate the local seeds without cutting .

* Department of Agricultural Economics & Statistics. Ministry of Agriculture and Land Reclamation , A. R. Egypt .

Several factors affect potato yield such as seed weight ,seed source and eyes number per tuber .Also cutting the seeds affects the yield and its quality through the infection possibility from soil and it may deteriorate at the high temperature and high soil moisture so it may give low stand percentage .

Tissue culture methods produce high quality seeds because this seed is virus free ,but in Egypt, tissue culture products are still insufficient to be an alternative seed source beside it is expensive but in the future the cost may be low.

Generally,in Egypt there is a wide desert surrounding the old valley so that the future of the egyptian potato production will be in this desert .

Developing the desert is the main aim in Desert Research Center so this trial was carried out in the sandy soil conditions to study the effect of different vegetative propagation seed on potato yield and quality under sandy soil conditions .

2.REVIEW OF LITERATURE

2.1. Growth characteristics

2.1.1.Emergence percentage.

The physiological age of potato tuber seed affects emergence via its effect on seed sprouting .Wiersema (1985) concluded that physiological age affects plant emergence , stem number , tuberization , vegetative growth , maturation and yield .Moreover , the previous characters decrease at the old physiological age .

El-Gizawy *et al.*(1987) reported that emergence of local produced potato tuber seeds sprouted for 2 or 4 weeks were faster than that of imported seed tubers .

Abd El-Hak *et al.* (1990) reported that final plant stand was not affected by potato cultivar but it was significantly greater by using large size of seed tubers .

Seedling tuber derived from true potato seed ranging in weight from 0.5 to 35 g showed that the emergence was generally faster with large tubers than with small ones , but the final emergence was about 90% regardless of seedling tuber weight (Engels *et al.*1993a).

On the other hand , emergence after 30 day was higher from entire seed tubers than seed tuber pieces as recorded by Coraspe and Cartaya (1994) .

Lommen and Striuk (1994) stated that the heavier mini tuber gave more regular emergence . In addition, Lommen and Striuk (1995) stated that lighter tubers took longer period to produce sprouts of 2 mm. Moreover, the sprouts grew more slowly between 2 and 4 mm. The influence of tuber weight was non significant for heavier tubers and also decreased as the sprout grew longer.

Vecchio *et al.* (1996) concluded that 100% emergence achieved by 40 days after planting with mini tubers >15 mm diameter . As for cultivar , Alba

emergence was the most quickly as compared with Spunta cv.

2.1.2. Plant fresh and dry weight .

El - Beheidi *et al.* (1975) cleared that growth of plants , expressed as foliage fresh weight , varied according to potato cultivars whereas Grata and Desire showed more vigorous growth followed by Alpha .On the contrary , Wilga and Seniada had poor foliage weight .

Abd El-Hak *et al.*(1990) reported that seed size significantly affected the plant vigour, also cultivars significantly affected the plant vigour . Spunta and Korrigan showed significant increment as compared to variety Lola.

Byszewska *et al.*(1993) concluded that potatoes cv. Lotos and Foka were grown from elite seed tubers (3 - 4 cm) or mini tubers (1 - 2 cm) planted at a rate of 80 000 or 160 000 plants/ ha. After 75 days from planting, fresh weight from mini tubers was 422 -461 g. and that from traditional seed tubers was 439 - 608 g

El-Nashar *et al.* (1995) mentioned that large seed size of 4.5-6.0 cm gave the highest significant foliage weight at harvesting time and small size of 2.5 - 3.5 cm gave the lowest values while medium seed size of 3.4 - 4.5 cm was in between , the same outhier showed that cultivars had significant effect on foliage weight . The highest foliage weight was obtained by Spunta followed by Mondial , while the lowest foliage weight was obtained by Diamant and Baraka.

Rabie(1996) concluded that significant differences were observed among cultivars in plant fresh and dry weigh .

2.1.3. Plant height .

Mahmoud and Gill (1984) reported, in their study on Disiree , Wilja , Multa and Diamant cultivars and three tuber weights (25 , 50 and 75 g.) ,that Disiree tubers weighing 75 g had the favorable effect on plant height .

El- Gizawy *et al.* (1987) reported that plant height at 50 , 70 and 90 days after planting was not affected significantly with whole tuber or cut seed tuber .

Ibrahim *et al.* (1990) cleared that significant differences in plant height were shown among Ajax , Alpha and Nicola potato cultivars .

In addition , El Nashar *et al.* (1995) cleared that tuber size had significant effect on plant height . It was the highest with planting of large seed tubers size , while small tubers size caused a dwarfing effect on stem length . Also ,stem length was significantly affected by cultivars whereas Spunta had the highest plant length in all seasons followed by Diamant in the first and third seasons and Baraka in the second season , the shortest plant was obtained with Mondial in all seasons.

Rabie(1996) reported that significant differences were observed among potato cultivars in stem length .

In a study carried out to assess the performance of Alba cv. potato mini tubers were compared with conventional seed tubers of potatoes cv.Spunta , Vecchio *et al.* (1996) mentioned that plant height reduced with tubers < 15 mm and there were significant difference between the tested cultivars .

2.1.5. Number of stems and branches.

El - Baz *et al* (1980) , Abd El-Hak *et al* (1990 and 1991) and Ibrahim *et al* (1990) studied the difference in number of main stems , they found that the number of main stems differed significantly among potato cultivars .

Entz and Lacroix (1984) found that the main stems per plant were influenced by seed tuber piece weight, while number of axillary branches was increased by decreasing competition.

Hassan (1991) reported that sprouting of seed tubers was affected by apical dominance. Most of potato cultivars showed no difference among the different seed tuber pieces. However, different pieces of Kennebec and Sebago cultivars sprouted at the same time if it was cut before sprouting of the apical eye. But if it was cut after, the apical pieces sprouted first and gave higher yield than the other pieces.

Stems number in plants as related to the number of eyes in tuber depended on the cultivar which was statistically significant. The relationship between this character and tuber weight is linear. Mother tuber mass per each eye was not the same in all cultivars. The information on the percentage of stems in relation to the total number of eyes per tuber may be used for calculation of potential stem number produced per area unit after planting with seed potato of specified size (Roztropowicz and Pietryka, 1993).

Byszewska *et al.* (1993) concluded that potatoes cvs. Lotos and Foka were grown from elite seed tubers (3 - 4 cm.) or mini tubers (1 - 2 cm.) planted at a rate of 80 000 or 160 000 plants/ ha. After 75 day from planting stem number per plant were 1.1 - 1.5 for mini tubers and 3.5 - 5.5 for traditional seed tubers at the different densities, respectively.

Engels *et al.* (1993a) reported that plants grown from seedling tubers smaller than 20g showed more axillary branches than plants grown from large tubers, whereas axillary branching was mainly restricted to the apical nodes in plants grown from large seedling tubers.