

106 cu o abatere de la martor de 2,4 cm unde diferența limită alcătuind doar 0,5 cm. Influența anilor de cercetare nu se deosebesc esențial după acțiunea lor. Însă cel mai favorabil după abaterea de la martor s-a dovedit a fi anul 2003 ca și în experiența cu metodele de altoire.

După plantarea pomilor din containere în livadă la locul permanent, în vederea creșterii și dezvoltării plantelor s-au efectuat operațiuni tehnologice conform recomandărilor tehnologice recomandate și întărite în cadrul Institutului de Pomicultură

CONCLUZII

Rezultatele investigațiilor referitor la influența metodelor de producere a pomilor și a portaltoiurilor utilizați la producerea materialului săditor de măr prin containere ne permite să constatăm:

- Pomii altoiți de măr obținuți prin metoda de container și plantați la locul destinat (livadă) au un gradul înalt de prindere a pomilor.

- Metodele de producere a pomilor acționează esențial (39 %) asupra creșterii și dezvoltării plantelor, însă acțiunea portaltoiurilor asupra dezvoltării plantelor constituie doar 25 % din numărul total de factori.

- Metodele de altoire (în marcotieră și la masă) a pomilor plantați din containere acționează asupra creșterii și dezvoltării lor până la momentul de plantare în livadă. Ulterior, creșterea și dezvoltarea plantelor depinde de condițiile climaterice și agrotehnica aplicată.

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RESPONSE OF ANNA APPLE TREES TO FOLIAR APPLICATION OF SALICYLIC ACID

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Abstract. Yield and fruit quality of Anna apple trees in response to spraying Salicylic acid at 50 to 400 ppm three times were investigated during 2006 and 2007 seasons.

Results showed that carrying out three sprays of salicylic acid at 50 to 400 ppm was essential for improving yield and fruit quality of Anna apple trees rather than the check treatment. The promotion was associated with increasing concentration.

Spraying Anna apple trees three times with salicylic acid at 200 ppm was favorable for enhancing yield and fruit quality of Anna apple trees.

Key words: Salicylic acid, Anna apple trees, Yield and fruit quality.

INTRODUCTION

Improving yield and fruit quality of Anna apple trees is considered important tasks for pomologists. Out of these trials was the application of the antioxidant namely salicylic acid (SA).

The widespread of free radicals or active oxygen species namely singlet oxygen, superoxide anion, hydrogen peroxide, hydroxyl radicals and ozone produced through photosynthesis, respiration and other metabolism processes are accompanied with destroying plant cells and accelerating most plants to reach senescence. Antioxidants namely organic acids, amino acids and vitamins may play a definite role in solving the problem of poor yield through stimulating growth and nutritional status of trees. They have an important role in protecting the plant cells from senescence and death, preventing the free radicals from oxidation of lipids, the components of plasma membrane which is accompanied with the loss of permeability as well as their effects in enhancing cell division and building of organic acids and the biosynthesis of organic foods and controlling the incidence of fungal attack (Elade, 1992).

Salicylic acid (SA) is classified under the group of plant hormones. It is assigned diverse regulatory roles in the metabolism of plants. It has direct involvement in plant growth, flower induction and uptake of ions. Salicylic acid affects ethylene biosynthesis, stomatal movement and also reverses the effect of ABA on leaf abscission. The application of SA to some plants accelerated plant pigments and root differentiation (Khan *et al*, 2003).

The results of Vorobev (1999), Abd El-Aziz (2001), Ahmed and Morsy (2001), Ahmed and Abd El-aal (2007), Abd- El-Kriem (2008) and Allam (2008) emphasized the beneficial of antioxidants on yield and fruit quality of fruit crops.

The merit of this study was examining the effect of SA on yield and fruit quality of Anna apple trees.

MATERIALS AND METHODS

This study was carried out during 2005 and 2006 seasons on fifteen -ten years old Anna apple trees budded onto MM 106 samalout, Minia Governorate, Egypt. The texture of the soil is sandy. The Trees are planted at 3.5 x 3.5 meter apart. Dorset Golden and Ein-Shemir pollinizers were distributed between Anna apple trees.

The experiment included five treatments from SA concentrations namely control (0.0 ppm), 50, 100, 200 and 400 ppm. SA was sprayed three times at growth start, just after fruit setting and at one month later. Triton B as a wetting agent was used at 0.1%. Normal horticultural practices were carried out as usual. The following parameters were measured: yield/tree, fruit weight, total soluble solids, total and reducing sugars and total acidity (as malic acid) (A.O.A.C, 1995).

All the obtained data were tabulated and statistically analyzed according to Gomez and Gomez, (1984) using new L.S.D at 5%.

RESULTS AND DISCUSSION

Yield -1

Spraying Anna apple trees with salicylic acid (SA) at 50 to 400 ppm significantly improved the yield rather than non-application. The increase was associated with increasing SA concentrations. A slight promotion was detected among the higher two concentration. Spraying the trees three times with SA at 200 ppm produced an economical yield. Untreated trees produced the minimum values. These results were true in both seasons (Table 1).

These results are in harmony with those obtained by Abd El-Aziz (2001), Abd- El-Kriem (2008) and Allam (2008).

Fruit quality -2

It is clear from the obtained data that spraying the trees three times with SA at 50 to 400 ppm was favorable in improving fruit quality in terms of increasing fruit weight, total

soluble solids, total and reducing sugars and in decreasing total acidity rather than non-application. The promotion was associated with increasing SA concentrations. The best results were recorded on the trees received three sprays of SA at 200 ppm since no material promotion was detected among the higher two concentrations of SA. Similar trend was noticed in both seasons.

These results are in harmony with those obtained by **Abd El-Aziz (2001)**, **Abd- El-Kriem (2008)** and **Allam (2008)**.

Finally, spraying Anna apple trees three times with SA at 200 ppm is considered the best results with regard to yield and fruit quality.

Table 1: Effect of Salicylic acid (SA) concentrations on yield and some fruit quality characters of Anna apple trees during 2006 and 2007 seasons

S.A conc.	Yield/tree (Kg)		Fruit weight (g)		T.S.S.%	
	2006	2007	2006	2007	2006	2007
Control	41.0	49.0	100.1	102.0	12.0	12.5
50 ppm	43.3	51.5	108.0	110.0	12.7	13.0
100 ppm	46.0	55.0	114.0	118.0	13.8	13.6
200 pm	48.3	58.0	120.0	125.0	14.4	14.2
400 ppm	48.5	59.0	121.0	126.0	14.5	14.3
L.S.D at 5%	1.5	2.0	5.1	6.0	0.5	0.4

Table 2: Effect of Salicylic acid (SA) concentrations on some fruit quality characters of Anna apple trees during 2006 and 2007 seasons

S.A conc.	Total sugars %		Reducing sugars %		Total acidity%	
	2006	2007	2006	2007	2006	2007
Control	9.0	8.8	4.1	3.7	0.541	0.550
50 ppm	9.5	9.4	4.7	4.1	0.498	0.500
100 ppm	10.1	10.0	5.1	4.5	0.450	0.450
200 pm	10.5	10.6	5.6	5.0	0.400	0.397
400 ppm	10.7	10.7	5.7	5.1	0.397	0.395
L.S.D at 5%	0.4	0.5	0.3	0.3	0.041	0.049

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