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EFFECT OF SPRAYING WITH WILT-PRUF, GROFALCS AND BENZYL ADENINE ON STORAGE LIFE AND QUALITY CHARACTERISTICS OF FRUITS FIG TREE CV KADOTA (FICUS CARICA L)

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ABSTRACT

An experiment was conducted in a private orchard at AL-Abbasyia, Najaf Governorate during the growing season of 2016 on fig CV. Kadota. The trees were sprayed with two concentrations of Wilt-Pruf (2 and 4 %), Grofalcs and benzyl adenine at concentration 300 mg/ L each other in single way or in combination with Wilt-Pruf at 15 march and on 15 June. In 15-8 -2016 take 2kg fruits from trees. The fruits of these treatments were stored at $5C^0$ and 80-85% R.H. for 10 days**.** Results showed that spraying trees with Wilt-Pruf, Grofalcs and BA treatments and their interactions caused a significant decrease percentage disease of *Aspergillus Niger*, *Alternaria tenuis*, *Penicillium explosion* Souring, *Alternaria Fiji*, *Fusarium solani*, *Ulocladium atrum*, total decay, percentage of weight loss and increase total soluble solids, vitamin C and degree of taste in the end of the storage compared to control treatment. There was a significant effect between treatment. Treatment of spraying Wilt-Pruf 4% + Grofalcs and BA in concentrate 300 mg / L gave a significant effect and the best results for the year of the experiment.

KEYWORDS: Wilt-Pruf, Grofalcs, Benzyl Adenine, Fig CV. Kadota

INTRODUCTION

Fig fruits are infected by a number of physiological and biological damages, and the foremost damage is fungal decay in the storage or orchards, which its ratio increased due to the increase in periods of storage (Gerber, 2010). AL-Eneabi (2008) noticed that, the spraying of material, wax Vapor -Gard at percentage (2, 3 and 4 %) and calcium chloride at a concentration (500, 750 and 1000 mg/L) on fig trees CV. Aswod Diala at depressed period reduced the proportion of fruit cracking and increased the weight of fruit, fruit firmness, percentage humidity of fruits, percentage of carbohydrate, total yield and its quality. Sabir, *et. al.* (2004)) observed that apple trees when applied at (2 and 3%) from antitranspirant after 60 days from full bloom increased yield and fruit quality compared with control treatment. Abdlecho (2013) noticed that, spraying the local pomegranate trees with a wax material Wilt – Pruf at percentage (2 and 4%) produced increasing significant in the percentage total soluble solid, acid and vitamin C in juice of fruits. AL – Ebraheme (2013) noticed that, spraying apple c.v. Read summer tress with two concentrations of castor oil (2 and 4) % produced increasing significantly in the moisture peels, pulp, juice percentage and reducing the cracking, T.S.S, acidity and Vitamin C in the juice during fruits ripening. AL – Noumani (2013) found that spraying local apple trees with an antitranspirant led to increased total soluble solids, total sugar, vitamin C and firmness at ripening. This was agreed with AL – Hmeedawi and AL –Malikshah (2016) when local sours orange trees were sprayed at 1 / 10 / and 1 / 11 / 2014 with three concentrations of Grofalcs (200,300 and 400 mg/L) and stored fruit of its trees at $5C^0$ and 80- 85 RH. Abo-Zaid (2000) mentioned that,

spraying of GA3 at conc. of (100 and 150 ppm) on pear trees in Egypt has increased the fruit qualities and physiological disorder. AL – Noumani (2013) found that spraying local apple after 50 days from full bloom with Grofalcs at conc. of (200, 300 and 400) mg/L led to reduction in percentage of fruit dropping and cracking and increased total soluble solids, total sugar, vitamin C and firmness at ripening. AL – Hmeedawi *et. al.* (2012) noticed that, that spraying fig tress CV. "Waziri" after one week from rest period of fruits with Zeatin at conc. of (100, 150 mg / L) caused a significant increased fruit firmness, percentage humidity of fruits, total yield, total soluble sold, acidity and Vitamin C of fruits compared with control treatment. AL- Uajjani (2011) noticed that, the pruning of fig trees cv. Aswod Diala at level (25 and 50)% at 15 / 1 / 2009 and spraying fig tress with BA at conc. (100, 150 mg / L) at 15 / 3 / 2009 increased the total percentage of carbohydrate, Total soluble solids, vitamin C and firmness of fruits compared to control treatment. AL – Hmeedawi and AL –Shammery (2016) mentioned that, spraying the trees local fig CV. Aswod Diala with Stickchut at concentrations of (2 and 4%) and Groplanofix at conc. of (3oo and 4oo mg/L) in single way or in combination at 15 march and 15 May,2015 gave the best results in the improve fruit quality. The main objective of this investigation is to study of the effect of using Wilt-Pruf, Grofalcs and benzyl adenine on reducing the percentage of fungus disease, total decay, weight loss and improve stability of the fruits of fig CV. Kadota that stored 10 days at 5C and 80- 85 R.H.

MATERIALS AND METHODS

This study was conducted in a private farm at Abbasiya / Najaf governorate for the season 2016 on fig trees CV. Kadota, 36 at the same size and growth trees were selected with 12 years of age, that planted on (5 x 5 m.), they watered every five days, and fertilized by Nitrogenous and phosphoric in two periods in March and May of each year at a rate of 500 g. per tree, as well as by manure for the two years. The experiment included 12 treatments with three replicates. It is adopted according to Randomized Complete Block Design (RCBD), and the results were statistically analyzed according to LSD test at the probability level of 5% (Al-Rawi and Khalf Allah, 2000). Trees spraying with two concentration of Wilt-Pruf (2 and 4 %) and Grofalcs and benzyl adenine at concentration 300 mg/ L each other in single way or in combination with Wilt-Pruf at 15 march and on 15 June. Grofalcs, (it were discs of GA3 50% from the production of Green river company. India). Wilt-Pruf, it was (Material wax contains Etokscouine 10% + di-2-p-mention 90%). Spraying was done early morning until wetness was full addendum. Tween 20 was added at conc. of 1cm3/L as spreader material. The experiment involved the following10 treatments:

- Control treatment (sprayed with tap water).
- Wilt-Pruf as foliar sprays at concentration of 2%.
- Wilt-Pruf as foliar sprays at concentration of 4%.
- Grofalcs as foliar sprays at concentration of 300 mg/L%.
- Benzyl adenine (BA) as foliar sprays at concentration of 300 mg / L.
- (Grofalcs + BA) as foliar sprays at concentration of 300 mg/L.
- Wilt-Pruf + Grofalcs as foliar sprays at concentration (2% + 300 mg/L).
- Wilt-Pruf + BA as foliar sprays at concentration (2%+ 300 mg/L).

- Wilt-Pruf + Grofalcs as foliar sprays at concentration (4% + 300 mg/L).
- Wilt-Pruf + BA as foliar sprays at concentration (4% + 300 mg/L).
- (Wilt-Pruf + Grofalcs + BA) at concentration (2% + 300 mg/L +300 mg/L).
- (Wilt-Pruf + Grofalcs + BA) at concentration (4% + 300 mg/L +300 mg/L).

In 15-8 -2016 harvested 72 Kg fruits similar in size and color without dieses and mechanical injures from trials of the experiment. Fruits were divided into 12 treatments, weight 6 Kg for each treatment. The fruits of each previous treatment were divided into 3 replicates and each part weight was 2 Kg. These parts were placed in polyethylene bags with 22 holes for each bag and the diameter of the hole was 0.5 cm. The fruits were stored under $5C^0$ temperature and relative humidity 80-85 % for 10 days starting at 15 / 8 /2016. The design for this treatment was similar to that of the field experiment. In 25 / 8 /2016 fruits were taken out and traits were measured. The percentage disease of *Aspergillus Niger*, *Alternaria tenuis*, *Penicillium explosion* Souring, *Alternaria Fiji*, *Fusarium solani*, *Ulocladium atrum*, total decay and percentage of weight loss according to (Lisa and Kader 2003). Acidity percentage, Vitamin C mg /100 ml Juice, according to (A.O.A.C, 1985). The total soluble solids were determined by hand refract meter.

RESULTS AND DISCUSSIONS

The Percentage Disease of *Aspergillus Niger, Alternaria Tenuis, Penicillium Expausum* Souring, *Alternaria Fici, Fusarium Solani, Ulocladium Atrium and* Total Decay

Data in Table (1) shows that,, spraying trees with Wilt-Pruf, Grofalcs and benzyl adenine in single way or combination led to decreased in the percentage disease of *Aspergillus niger*, *Alternaria tenuis*, *Penicillium expausum* Souring, *Alternaria fici*, *Fusarium solani*, *Ulocladium atrum* and total decay significantly compared to control treatment, The treatment (Wilt-Pruf 4%+ Grofalcs 300 mg/L + BA300 mg/L) gave the lowest values in percentage disease and total decay they were (0.62, 0.85,0.70, 2.31,0.57, 0.30, 1.33 and 6.48) in comparison to the highest rates (1.50, 1.74,1.63, 3.27,1.72, 1.13, 3.98 and 14.70) in control treatment in the end of storage. The decrease in different type of fungi decay and total decay in fruits as a result of Wilt-Pruf, Grofalcs and benzyl adenine led to its role in making new balance in fruits and around between O_2, CO_2 and ethylene. The increase of water content in fruits leads to decrease the percentage of decays (Roy, 2008). AL –Shammery (2014) mentioned that, the wax materials and growth regulator protected fruits from some biological dieses are which caused by fungi and Bacteria.

Weight Loss Percentage

Data in Table (2) shows that, spraying trees of local fig cv. Kadota with Wilt-Pruf, Grofalcs and benzyl adenine led to significantly decreased the percentage of weight loss after storage that gave the lowest percentage 4.30% in the treatment (Wilt-Pruf 4%+ Grofalcs 300 mg/L + BA300 mg/L) in comparison to the highest percentage 6.15% in the control treatment.The reason of decreasing the percentage of weight loss of fruits lead to influence these materials in some physiological changes in the fruit peel.This process leads to increase the poly amines which it used to enhance the stability of cell membranes.The poly amines are in content to nucleic acids in structure of membranes and this leads to make the peel thick and firmness and decrease the moisture loss.The result is decreasing the rate of respiration which decrease the loss in weight (Jundi, 2003).

Total Soluble Solids, Acidity, Vitamin C And Degree of Taste of Fig Fruits

Data in Table (2) shows that percentage of total soluble solids**,** Vitamin C and degree of taste in fruits were increased significantly when trees sprayed with Wilt-Pruf, Grofalcs and benzyl adenine in single way or combination,, while the acidity was decreased on pre and post storage in the all treatments compared to control treatment. The highest significance result were recorded in treatment (Wilt-Pruf 4%+ Grofalcs 300 mg/L + BA300 mg/L), that gave the highest percentages of total soluble solids, Vitamin C and degree of taste, they were (16.63 %, 7.49 mg / 100 ml Juice and 3.80) comparison with lest rates of percentages (15.05 %, 6.51 mg / 100 ml Juice and 1.25) in the control treatment respectively at the end of storage. The increase in chemical companied of fruit juice because of fruits treated with such materials led to increasing the loss in weight, increase in firmness peel of fruits and reduction the respiration rate (Hayat, et.al, 2003, Stern, 2008).Increasing fruits from total soluble solids, Vitamin C and firmness of fruits which results through spraying growth regulator and antioxidant materials due to the fact that this compound reduce vegetative growth and thus encourages the accumulation of carbohydrate materials in fruits leading to increased content of these materials (Ferguson *et. al.*,1999).

CONCLUSIONS

It could be concluded from this experiment that, spraying trees with Wilt-Pruf, Grofalcs and benzyl adenine in single way or combination led to decreases in the percentage disease of *Aspergillus Niger*, *Alternaria tenuis*, *Penicillium explosion* Souring, *Alternaria Fiji*, *Fusarium solani*, *Ulocladium atrum*, total decay, percentage of weight loss and increased total soluble solids, vitamin C and degree of taste in the end of the storage compared to control treatment.

Table 1: Effect of Spraying with Wilt-Pruf, Grofalcs and Benzyl Adenine (BA) On Percentage Disease and Total Decay of Fig Fruits cv. Kadota After 10 Days from Storage at 5Cand 80-85% R.H. for Season 2016

Treatments	Aspergillus Niger	Alternaria Tenus	Alternaria Tenum	Souring	Alternaria Fici	Fusarium Solani	Ulocladium atrum	% Total Decay
Control	1.50	1.74	1.36	3.27	1.72	1.13	3.98	13.70
Wilt-Pruf 2%	1.32	1.45	1.22	3.10	1.40	0.94	2.89	12.32
Wilt-Pruf 4%	1.09	1.16	1.12	2.89	1.31	0.77	2.50	10.84
Grofalcs 300 mg/L	1.17	1.20	1.25	3.08	1.39	0.85	2.77	11.17
benzyladenine (BA) 300 mg/L	1.39	1.56	1.28	3.19	1.45	0.99	2.45	12.31
(Grofalcs + BA)300 mg/L	1.35	1.60	1.30	3.15	1.43	0.91	2.21	11.90
Wilt-Pruf 2%+ Grofalcs 300 mg/L	1.21	1.27	1.04	2.96	1.19	0.75	2.35	10.77
Wilt-Pruf 2%+ BA 300 mg/L	1.10	1.13	0.90	2.72	1.05	0.60	2.40	10.84
Wilt-Pruf 4% + Grofalcs 300 mg/L	1.25	1.30	1.09	3.03	1.15	0.77	2.19	10.78
Wilt-Pruf 4% + BA 300 mg/L	0.98	1.01	0.88	2.59	0.94	0.53	2.11	9.04
W-P2%+ Grofalcs + BA)300 mg/L	0.84	0.96	0.83	2.66	0.82	0.55	1.78	8.44
W-P4%+ (Grofalcs + BA)300 mg/L	0.62	0.85	0.70	2.31	0.57	0.30	1.33	6.48
L. S. D. 0.05	0.09	0.11	0.05	0.07	0.23	0.12	0.52	0.79

Table 2. Effect of Spraying with Wilt-Pruf, Grofalcs and Benzyl Adenine (BA) on Physical and Chemical Parameters of Fig Fruits cv. Kadota After 10 Days from Storage at 5Cand 80-85% R.H. for Season 2016

Treatmemts	% weigh Loss	%T.S.S pre Storage	%T.S.S Post Storage	%Acidity Pre Storage	%Acidity Post Storage	Vitamin C mg / 100 ml Juice	Vitamin C mg / 100 ml Juice	Degree of Taste
Control	6.15	15.80	15.05	0.330	0.290	8.18	6.51	1.25
Wilt-Pruf 2%	5.44	16.27	15.60	0.317	0.278	8.29	7.05	1.90
Wilt-Pruf 4%	5.18	16.86	15.96	0.299	0.255	8.35	7.13	2.32
Grofalcs 300 mg/L	5.39	16.91	16.23	0.301	0.252	8.50	6.98	2.20
benzyladenine (BA) 300 mg/L	5.45	15.97	15.49	0.315	0.286	8.53	6.99	2.25
(Grofalcs + BA)300 mg/L	5.23	16.94	16.14	0.295	0.258	8.41	7.10	2.71
Wilt-Pruf 2%+ Grofalcs 300 mg/L	4.93	16.50	15.72	0.309	0.271	8.71	7.00	2.75
Wilt-Pruf 2%+ BA 300 mg/L	5.12	16.64	15.80	0.292	0.245	8.54	7.15	2.87
Wilt-Pruf 4% + Grofalcs 300 mg/L	5.20	16.96	16.29	0.295	0.241	8.80	7.25	3.35
Wilt-Pruf 4% + BA 300 mg/L	4.85	17.07	16.40	0.287	0.249	8.69	7.28	3.41
W-P2%+ Grofalcs + BA)300 mg/L	4.66	17.15	16.47	0.281	0.234	8.85	7.33	3.59
W-P4%+ (Grofalcs + BA)300 mg/L	4.30	17.34	16.63	0.275	0.221	9.03	7.49	3.80
L. S. D. 0.05	0.33	0.15	0.41	n.s	n.s	0.05	0.15	0.36

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