

## EFFECT OF BUDDING DATE AND KINETIN CONCENTRATION ON BUDDING OF BALLAKI LOCAL PEAR CULTIVAR ON WILD TYPE PEAR AS ROOTSTOCKS.

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### ABSTRACT:

The study was conducted during the growing season of 2015, at Tawella, locating on 100 km south east of Sulaimani city, Kurdistan Region- Iraq. The aim of this study to determine the best date of budding between two date of budding (June5 and June20) and the best concentration kinetin between three concentration of kinetins (0, 5 and 10) mg/l. The results shows that June20 recorded the maximum value for budding success percentage (73.33%), bud shoots length(64.24cm), bud shoots diameter (0.98cm) and number of leaves (21.05). But higher value of number of branches (1.53) and leaf area (30.68cm<sup>2</sup>) recorded on June 5. On the other hand 5mg/l of kinetin recorded the maximum value for bud shoots length (72.71cm), bud shoots diameter (1.05cm), number of leaves (22.28) and number of branches (1.65).Whereas, 10mg/l of kinetin recorded the maximum value for budding success percentage (85%) and leaf area(30.75cm<sup>2</sup>).

Interaction of June20 and 5mg/l of kinetin gave (90%) of budding success percentage. But, June5 and 5mg/l of kinetin recorded the maximum value (73.75cm) for bud shoot length, (1.88) for number of branches and (31.91cm<sup>2</sup>) for leaf area. However, June20 and (0 mg/l) gave the maximum value for both the bud shoots diameter and number of branches (1.18cm and 24.20) respectively.

**Key words:** Wild pear, Budding, Kinetin, rootstock and budding date.

### INTRODUCTION:

Wild pear (*Pyrus pyraster* L. Burgsd.) belong to the Rosaceae family. Which is considered as the main wild ancestor from which the cultivated European pear (9, 10). This genus is interesting as the rootstock for commercial cultivars (7). It has tolerance to grow in the rocky calcareous soils and grown naturally by the large numbers in deeply slopes of oak forest of Kurdistan region (4). Wild pear is able to grow in drought condition and tolerant to more biotic and abiotic stresses (8). Even though propagation of the commercial pear through stem cuttings is not so easy.

Budding is very common in pear propagation by done it wild pear as rootstocks, which is sufficient to produce a rootstock plant large enough to be budded (2). In both micro and conventional plant propagation methods are commonly used auxins and cytokinins as growth regulators. Auxins and cytokinins have influence in cell enlargement and callus formation which is effect on injury healing. Plant growth regulators caused to increase the success percentage of peach budding the maximum value (88.88%) was recorded at using of 2,4,5-T at 20 mg/l (5). Budding time and budding methods had significant effects on budding of Loquat on the wild pear as the

rootstock, budding in mid-May gave the maximum value of budding success (68.20%) and the maximum value (8.60cm) of bud shoot length as well as the maximum value (7.03) number of leaves (1). Budding time and plant growth regulators have significant influence on the pistachio budding, the maximum value of budding success percentage (47.92% and 60.42%) and the maximum value of bud shoot length (17.22 and 17.3) cm recorded when budding performed on June 15 and using of 30mg/l IAA and 2mg/l Kinetin respectively. However, the maximum value increase of bud shoot diameter (4.28 and 4.43) mm recorded when budding performed on June 15 and using 0mg/l IAA and 4mg/l Kinetin respectively (3). Interaction between plant growth regulators and budding time recorded highly significant difference. The maximum value of budding success percentage (94.43% and 100%) recorded when it's done in June and using 10mg/l of Kinetin for budding of peach on apricot seedling and peach on almond seedling respectively. Also, 10 mg/l of kinetin and budding performed on June gave the maximum value of average number of lateral shoots (7.00 and 6.79) for budding peach on apricot seedling and peach on almond seedling respectively (6).

#### MATERIALS AND METHODS:

The study was conducted during the growing season of 2015, at Tawella, locating on 100 km south east of Sulaimani city, Kurdistan Region- Iraq. The local pear cultivar (Ballaki) was used as the scion and wild pear (*Pyrus pyraster* L. Burgsd.) trees which are growing naturally were used as the rootstock, trees are 15-20 years old were selected for the study. The treatments composite of two dates of budding (June 5 and June 20) and three concentrations of Kinetin (0, 5 and 10) mg/l. For each tree 4-6

of the suitable outer periphery of spring growing shoots were selected then used in top working process with the T-budding method. The scions were taken directly before the budding process, then soaking quickly in the Kinetin solution. The experiment was laid out in a factorial randomized complete block design with three replications and ten buds per replication. The following parameters were recorded on November 1, 2015.

- 1- Budding success (%)
- 2- Bud shoot length (cm)
- 3- Bud shoot diameter (cm)
- 4- Number of branches
- 5- Number of leaves
- 6- Leaf area (cm<sup>2</sup>)

#### RESULTS AND DISCUSSION:

**Figure 1:** Shows that the interaction between kinetin concentration and budding dates had significant influence on budding success percentage. The maximum value (90%) of budding success percentage was recorded when the using of 5 mg/l kinetin and when it was performed on June 20 which was significantly effect on some treatments particularly on which have 0mg/l instead of the kinetin. Subsequently, recorded 80% of budding success when the using of (5 and 10) mg/l of kinetin were performed in June 5 and June 20 successively. But lowest value 50% were recorded when using (0 and 10) mg/l kinetin were done in June 20 and June 5 successively. The result is agreement with the reported Kako et al., 2012 (5) that showed that the budding success percentage response to plant growth regulators and agree with Hama Saleh, 2004 (3) that reported the later of June and using plant growth regulators had significantly effect on budding success percentage. Then, the results partially agreement with what has been found by (6).

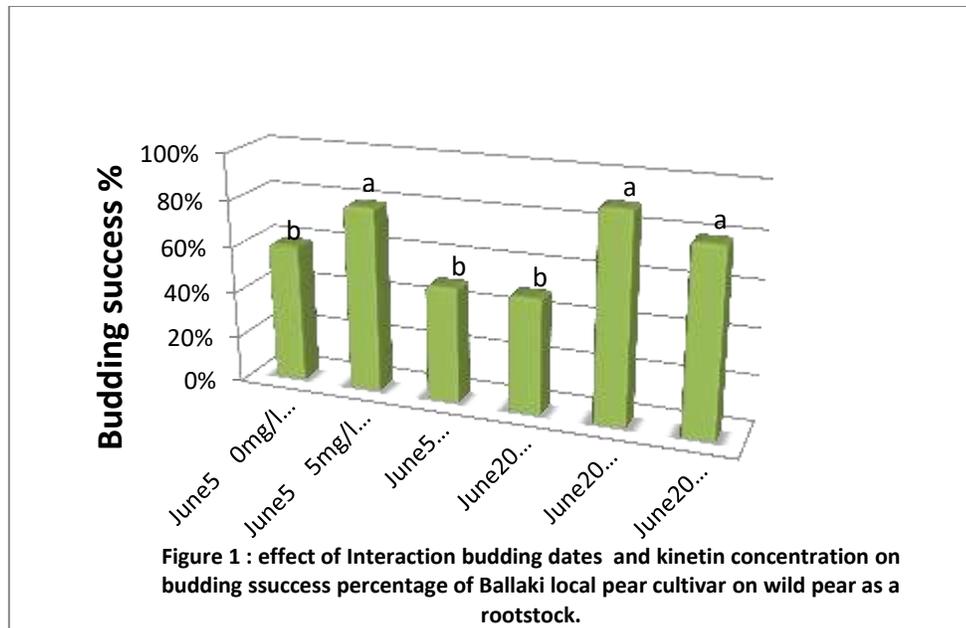


Table (1): Shows that the budding date on June20 was recorded the maximum value of budding success percentage (73.33%), which was significantly superior on budding performed on June5 which was recorded (63.33%). The maximum value for the bud shoot length (64.23 cm), bud shoot diameter (0.98 cm) and numbers of leaves (21.05) were recorded by the budding was performed on June20 but, which not significant with the June5. However, the maximum value for number of branches (1.53) and leaf area (30.68 cm<sup>2</sup>) were recorded by budding performed on June5. But, which not significant with the June20. On the other hand, using kinetin also had significant influences on some other of the vegetative characteristics. 10mg/l kinetin was recorded (85%) of budding success and significantly superior on 0 mg/l and 5mg/l of kinetin. Also the maximum value for bud shoot length (72.71 cm), bud shoot diameter (1.05 cm), numbers of leaves (22.82) and number of branches (1.65) were recorded by using 5mg/l kinetin and had a significant effect compared to 10 mg/l of kinetin. But, which not with the kinetin (0) mg/l. However, using 10mg/l of kinetin gave the maximum value of leaf area (30.75 cm<sup>2</sup>).

But, which not significant on the other treatments. These results disagree with Ali et al., 2012 (1) that reported the best budding time of loquat is the mid-May. But, agree with what has been found by Hama Salieh., 2004 (3) that reported the mid-June is the best time and kinetin have effects.

Table (2) Reveals interaction effects of budding times and Kinetin's concentration on budding. The maximum value for each bud shoot length (73.75 cm), number of branches (1.88) and leaf area (31.91 cm<sup>2</sup>) were recorded when it done on June5 and using 5mg/l of Kinetin, which was significantly superior on the kinetin concentration 10mg/l which it done on both dates June5 and June10 which recorded minimum value of bud shoot length (52.00 cm and 51.38 cm) for both dates respectively whereas, the minimum number of bud shoots

(1.20 and 1.13) for both previous dates successively. But, the minimum value of leaf area (27.22 cm<sup>2</sup>) was recorded during the using of 5mg/l Kinetin and when it's done on the June20. On the other hand, budding time

on June20 without Kinetin (0 mg/l) gave the maximum value for each characteristics bud shoot diameter and leaves number (1.18cm and 24.20) respectively. These results

agreement with the Hama Salieh, 2004 (3) that reported the later of June the best time for pistachio budding then, partially agreement with the (6) and (5).

**Table (1): Effect of interaction budding date and Kinetin concentration on budding of Ballaki local pear cultivar on wild pear rootstock.**

Treatments		Budding success %	Bud shoot length (cm)	Bud shoot diameter (cm)	Number of leaves	Number of branches	Leaf area (cm <sup>2</sup> )
Date	June5	63.33 b	62.37 a	0.94 a	19.48 a	1.53 a	30.68 a
	June20	73.33 a	64.23 a	0.98 a	21.05 a	1.36 a	28.99 a
Kinetin	0 mg/l	55.00 b	62.82 ab	1.04 a	21.64 a	1.46 ab	29.16 a
	5 mg/l	65.00 b	72.71 a	1.05 a	22.82 a	1.65 a	29.42 a
	10 mg/l	85.00 a	51.62 b	0.77 b	15.92 b	1.15 b	30.75 a

- Numbers followed by similar letters indicate no significant difference statistically when compared with other results.

**Table (2): Effect of Interaction budding date and Kinetin concentration on budding of Ballaki local pear cultivar on wild pear rootstock.**

Date	Kinetin	Bud shoot length (cm)	Bud shoot Diameter (cm)	Number of leaves	Number of branches	Leaf area (cm <sup>2</sup> )
June5	0 mg/l	55.83 bc	0.93abc	19.50 ab	1.33 ab	28.55 ab
	5 mg/l	73.75 a	1.04 ab	21.88 a	1.88 a	31.91 a
	10 mg/l	52.00 c	0.80 bc	15.60 b	1.20 b	31.26 a
June20	0 mg/l	71.20 ab	1.18 a	24.20 a	1.60 ab	29.89 ab
	5 mg/l	71.78 a	1.07 ab	23.67 a	1.44 ab	27.22 b
	10 mg/l	51.38 c	0.75 c	16.13 b	1.13 b	30.43 ab

- Numbers followed by similar letters indicate no significant difference statistically when compared with other results.

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