

Relation Ship Between The Physiological Disorder “CHOKE” and Fruit Content of Humidity, Dry Matter and Calcium In Iraqi Banana Fruits Cultivated In Basrah Region.

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Summary:

A study was conducted to find the relationship between physiological “choke A disorder” and fruit humidity, dry matter and calcium in Iraqi banana fruit in the different ripening stages. The result showed significant differences in the level of humidity and dry matter between the left tip and the base tip of the imperfect fruit that the left tip of the imperfect fruit content a higher ratio of humidity comparing it with the base tip as well as there was significant increase in the ratio of the dry matter and the calcium in the base tip in the imperfect fruit comparing it with its left tip. From this study we can conclude that the high humidity content and the little quantity calcium in the left tip in the fruits has an important role in the appearance symptoms of choke a disorder in Iraqi banana fruit.

Introduction

Banana is a large herbaceous plant from monocotyledon that belongs to *Musaceae* which include Genus *Musa* there are more than 25 species that fall under this species that Iraqi banana belong to it (Nakasone and paull, 1998). The Iraqi banana variety is considered as the most famous cultivated mainly in south of Iraq (Basrah region). This kind of Iraqi banana is cultivated under shad of the date palm and its fruits differ in length and diameter according to the different stages of growing and the fruit development (Agha and Daoud, 1990). The phenomena of choke a disorder fruits is considered as physiological disorder that led to the decrease of the quality of the Iraqi banana fruit, and thus it effect its prices, this phenomena means the softness the near part from the left tip of the fruit and the appearance of black area and this happiness during convert of the fruit from maturation stage of ripening stage and this well continues until arrival of the fruit into senescence stage which represent the stage that come after the fruit ripening stages (Turner, 1997).

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(AL-Ani;1984 , Agha and Daoud;1990 and Gowen;1995) indicated that the low temperature during the wet and cold months were the main cause in the happening of choke a disorder in inflorescence of Iraqi banana including choke a disorder. Abdul-Wahid (2006) tried to improve the quality of the Iraqi banana fruit for the purpose its preventing from physiological disorder through the use of one of the artificial ripening method which is presented by treating by 1000 ppm from ethephone in the maturation stage. While Naing (1991) found that humidity content of banana fruits begins decreasing until the maturation stage but he found that humidity content increasing in the fruit that expose physiological disorder with the increasing of the percentage for dry matter with mainly result from sugar accumulation. Kojima (1996) showed that there was relationship between firmness and chemical composition of the fruit specific its content of calcium elements which has a great important the firmness of the fruit because its considered the main elements which cooperation in the composition middle cell a wall which is found between primary walls. This is why this study was carried out to understand the relationship between the humidity content, calcium and choke a disorder in the different stages of ripening in Iraqi banana fruit.

Materials and method

This study was carried out in one of specific field in cultivating in spreading banana in orchard in Abu-Al-kassib in Basrah region during the agricultural season 2004-2005, nine plants of Iraqi banana which were similar in the vegetative growth and the age as possible were chosen and the following characteristics were calculated..

1. imperfect ratio in the choke a disorder banana fruits they were count from the following :

$$\text{imperfect ratio} = \frac{\text{imperfect fruits number}}{\text{total number of fruits}} \times 100$$

some sample from the fruit from each tree and during different growth stages from the beginning of the stage (5 week) after fruits setting to (20 week) were taking and fruit were cut in equal halves (left and base tip)(25) fruits from each tree were use in three replicate.

2. humidity content.

100 gm from the cut fruits were weight and put in vacuum ovens at 75° for 48 hours until stability of weight and the humidity content of the fruit was calculated from through

$$\text{humidity content (\%)} = \frac{\text{fresh weight of sample} - \text{dry weight of sample}}{\text{fresh weight of sample}} \times 100$$

relying Dalaly (1987).

While dry matter calculated from through

$$\text{Dry matter (\%)} = \frac{\text{Dry weight of sample}}{\text{Fresh weight of sample}} \times 100$$

3. calcium calculated

the dry sample of the halves of the fruits and for different growing stages were taking and crushed and then (300 mg) from the powder for each replicate were taking and the calcium was calculated quantify by using spectrophotometer (Cresser and Parson, 1979). the significance differences between the content of the halves of the fruit for the base and left tip were testing by using L.S.D. at 0.05 relying on (Al-Meshadani, 1989).

Result and discussion

The result of calculating the number of imperfect fruits of choke a disorder and the number of perfect fruits in banana bunches that were used in this study showed that the average of imperfect ratio was 29.88 % during the season of carry out this study and this ratio effects by mainly factors such as field location and the location of the fruits of the bunch as well as the total number from fruit on the bunch (Appendix n.1) show symptoms of choke a disorder of Iraqi banana fruits.

As far as humidity content, its seen from (histogram n.1) that it was high during the first stages of the fruit ripening in both (base and left tip) and the differences non significant and then began to decrease during the

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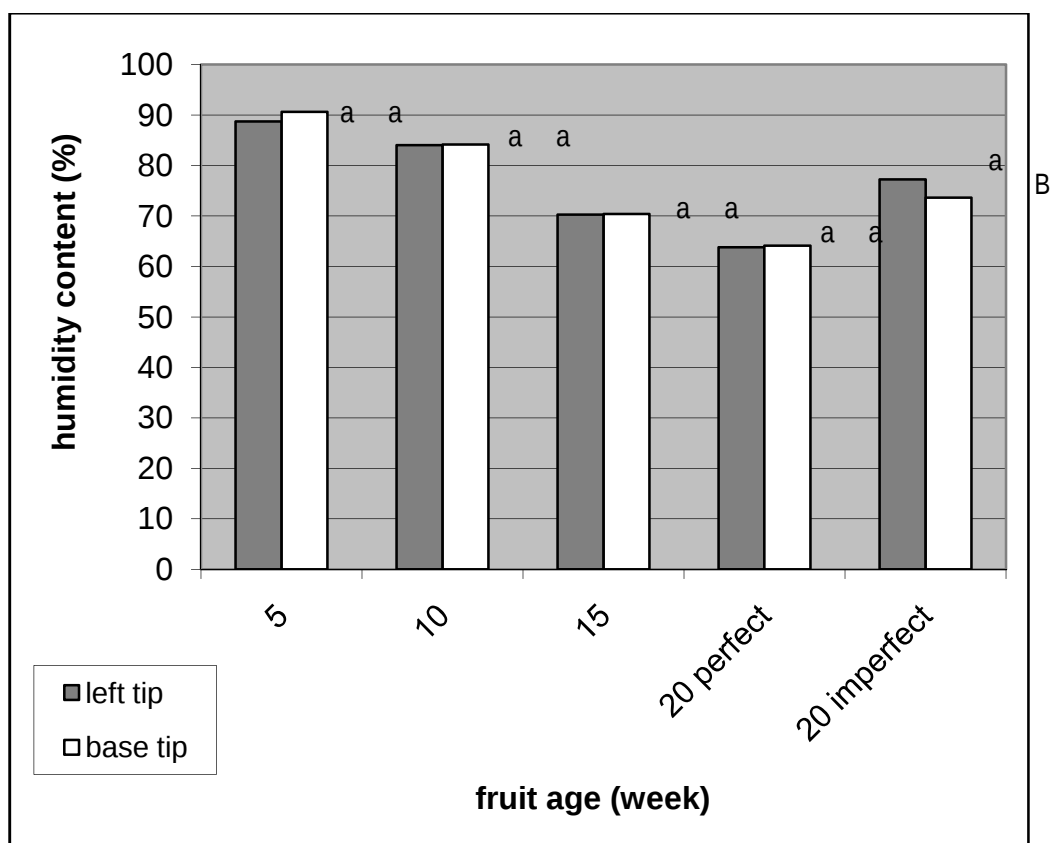
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ripening stages (20 weeks) concerning perfect fruit in both sides. No static's differences were seen at L.S.D 0.05 while this ratio was significance during the stage of (20 weeks) for the imperfect fruit as well as the left tip from it base tip.

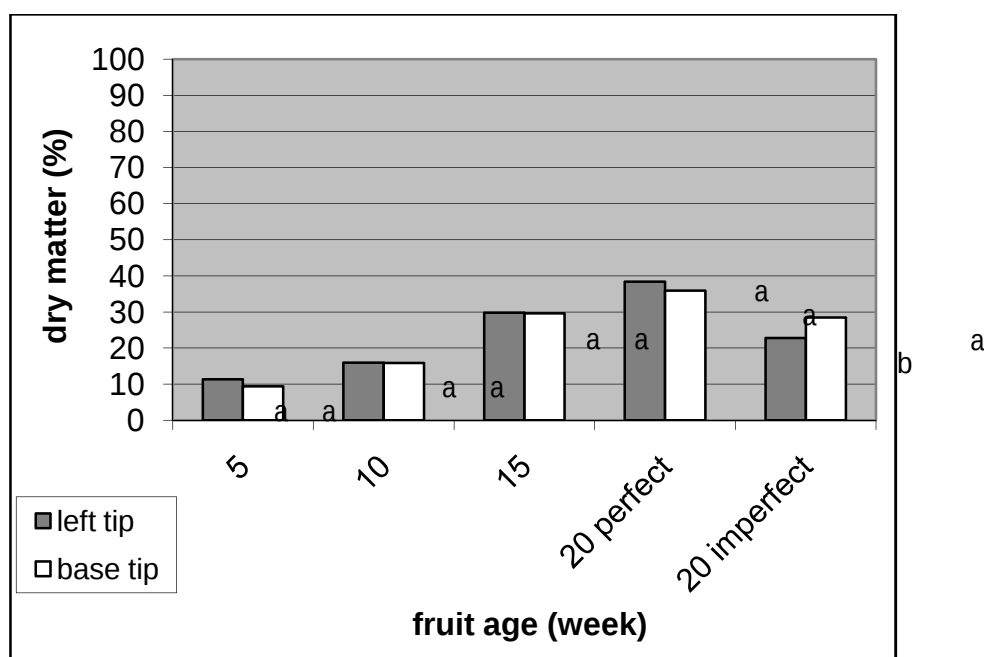
The histogram No.2 shows that the dry matter ratio began to increase during the ripening stage (20 weeks) and its was significant concerning the imperfect fruits of choke a disorder specially in the base tip and this belongs mainly to accumulation that happens in sugars in this agrees with (Naing, 1991) who sow that the humidity content increasing during the ripening stage specially in the fruit that exposes to the physiological imperfect as result of sugars hydrolysis .

And the contrary the ratio of dry matter percentage well increase because the great accumulation of sugars.

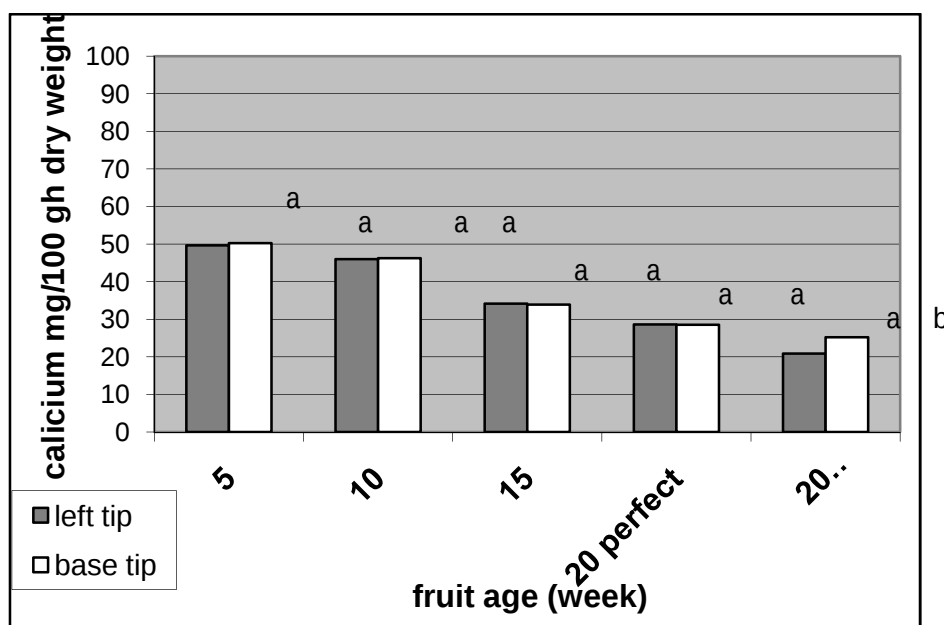
The following (histogram No.3) shows the content of the fruit halves of different stages of calcium (mg/100 gm dry weight) and its seen from the results that both left and base tip content high quantity of calcium during the stage (10 weeks) from fruit age and then it began to decrease as the fruit grow in age until it reach the ripening stage (20 weeks) . the differences were non significant for both fruit halves (left and base tip).For the perfect fruits while they were significant at (0.05) L.S.D. for the imperfect fruits that means it began to decrease (20.88 , 25.24) for both left and base tip and this caused by humidity content increase for the fruit during the ripening stage of the imperfect fruits (77.23 , 73.61).Consequently for both tips that well make it more softening and more ready to physiological a disorder and this means that calcium elements is the elements that has great relationship of fruit firmness because the element that cooperate in cell wall structure of the fruit and this agrees with what Kojima (1996) found its concluded from this study that both humidity content and the little quantity of calcium elements in the of left tip halves of the fruits are conceded of the most imperfect factors that participate in the happening of the choke a disorder in the Iraqi banana fruit. According to this study we recommend that, its very necessary in order to reduce this harm we should be careful in using good irrigation process , wind breaker, using calcium fertilization as well as using artificial ripening methods of the fruit during maturation stage.



Histogram No.1: shows relationship between humidity content and choke a disorder of Iraqi banana fruits



Histogram No.2: shows relationship between choke a disorder and dry matter of Iraqi banana fruits



Histogram No.3: shows relationship between calcium and choke a disorder of Iraqi banana fruits

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(Appendix No.). shows symptoms of choke a disorder of Iraqi banana fruits

العلاقة بين الضرر الفسلجي إسوداد طرف الثمار ومحتوى الثمار من الرطوبة والمادة الجافة والكالسيوم لثمار الموز العراقي في منطقة البصرة

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أجريت هذه الدراسة لمعرفة العلاقة بين محتوى ثمار الموز العراقي وفي مراحل النضج المختلفة من الرطوبة والمادة الجافة والكالسيوم وحدوث أعراض الضرر الفسلجي إسوداد *choke A disorder of banana* ، أظهرت نتائج الدراسة وجود علاقة طردية بين الرطوبة والمادة الجافة بين الطرفين السائب للثمار المصابة والطرف القاعدي لها.

حيث احتوى الطرف السائب للثمار المصابة أعلى نسبة من الرطوبة مقارنة بالطرف القاعدي كما ظهرت زيادة معنوية في نسبة المادة الجافة والكالسيوم في الطرف القاعدي في الثمار المصابة مقارنة بالطرف السائب لها. يستنتج من هذه الدراسة بأن المحتوى الرطوبي العالي وكمية الكالسيوم القليلة في الطرف السائب من الثمرة لها دور مهم في ظهور أعراض الضرر الفسلجي إسوداد طرف الثمار.