

STUDY AREA AND CONCLUSION

This investigation was carried out at the vineyard of the Agricultural Secondary School at Moshtohor, Kalubia Governorate, during two successive seasons 1987/1988 and 1988/1989 on two grape cultivars namely, Thompson seedless and Romi Red. The vines were 20 years old. The vines were trained according to the head system. The planting distance was 2 x 2 meters.

The main purpose of this study was to investigate the response of the two grape vine cultivars to foliar application of zinc, iron, manganese chelated and boric acid. The study included 103 vines represented the two studied cultivars. Thus, 54 vines from each cultivar were devoted to receive the following treatments:

1. Tap water spray "control"
2. Foliar spray with Zn 0.5%.
3. Foliar spray with Zn 0.5% + Fe 0.3%.
4. Foliar spray with Zn 0.5% + Mn 0.3%.
5. Foliar spray with Zn 0.5% + B 0.1%.
6. Foliar spray with Zn 0.5% + Fe 0.3% + Mn 0.3%.
7. Foliar spray with Zn 0.5% + Fe 0.3% + B 0.1%.
8. Foliar spray with Zn 0.5% + Fe 0.3% + B.
9. Foliar spray with Zn 0.5% + Fe 0.3% + Mn 0.3% + B 0.1%.

Zinc, iron and manganese were added in the EDTA form of these elements, while B was added as boric acid.

The differential investigated treatments were arranged in a complete randomized design, each one was replicated three times and every replicate was represented by two

vines.

Spray treatments were applied twice at full bloom period and after fruit set one month later during both 1987/1988 and 1988/1989 seasons.

Because of the trend of response to the different treatments in each cultivar was nearly the same and paralleled to the other , accordingly the data obtained for both cultivars will be summarized as follows:

A. Vegetative growth :

1. Bud burst percent:

Obtained results showed that foliar application either with Zn 0.5% + Fe 0.3% or Zn 0.5% + Fe 0.3% + Mn 0.3% solutions had no effect on the bud burst % as compared to control. Whereas all other treatments significantly increased bud burst percent over control in both studied cultivars during the two. studied seasons.

2. Vegetative shoot percent :

Obtained data showed that adding both Fe 0.3% ,Mn 0.3%, or each alone to the Zn 0.5% solution had no effect on the vegetative shoots percent. Whereas all other treatments decreased the vegetative shoots percent as compared with that of the control.

3. Fruitful shoots percent :

obtained results showed that adding both Fe 0.3% or Mn 0.3% either together or each solely to the Zn 0.5% solution

had no effect on the fruitful shoot percent. Whereas all other treatments increased the fruitful shoot percent as compared with that of the control. Foliar spray with Zn 0.5% or with Zn 0.5%+ Fe 0.3%+ Mn 0.3%+ B 0.1% as well as Zn 0.5% +B 0.1% solutions were the superior in this respect.

4. Shoot length:

The obtained data showed that all treatments significantly increased shoot length over the control. Whereas, foliar spray with Zn 0.5%+ Fe 0.3%+Mn 0.3%+B 0.1% was the superior in this respect.

5. Number of leaves per shoots:

The obtained data showed that all treatments significantly increased number of leaves per shoot over the control. The treatments Zn 0.5% and Zn 0.5%+Fe 0.3% +Mn 0.3%+B 0.1% were the superior in this respect.

6. Leaf area:

The obtained data showed that foliar spray with Zn 0.5%, Zn 0.5%+Mn 0.1%+B 0.1%, Zn 0.5%+Fe 0.3%+Mn 0.3%+B 0.1%, Zn 0.5%+Mn 0.3% and Zn 0.5%+Fe 0.3% +Mn 0.3% solutions significantly increased leaf area over control. Foliar spray with Zn 0.5%+ fe 0.3% + Mn 0.3% + B 0.1% and with Zn 0.5% were the superior in this respect.

7. Weight of one-year-old removed wood:

The obtained data showed that all spraying treatments significantly increased the weight of one-year-old removed wood. The highest value was obtained from the foliar spray

with Zn 0.5%+ Fe 0.3% +B 0.1%.

B. leaf mineral content:

1. Nitrogen content:

The obtained data showed that leaf nitrogen content was not consistently affected by the different treatments, however the leaf nitrogen content was decreased as the growing season advanced in both cultivars, regardless of the treatments applied.

2. Phosphorous content:

The obtained data showed that the foliar spray with any of the different combinations of the four studied micro-nutrients did not affect the leaf phosphorous content for both grape cultivars.

3. Potassium content:

The obtained data showed that leaf potassium content was not statistically affected by all treatments.

4. Zinc content:

The obtained data showed that leaf zinc content in both grape vines cultivars was increased obviously by all treatments which containing zinc over than that of the control. Foliar spray with Zn 0.5% was the superior in this respect. The residual effect was not clearly noticeable in the following season.

5. Iron content:

The obtained data showed that leaf iron content was increased obviously by all treatments which containing iron over than that of the control. Foliar spray with Zn 0.5% + Fe 0.3% was the superior in this respect . The residual ef-

fect was not noticeable in the following season.

6. Manganese content:

The obtained data showed that leaf manganese content was increased obviously by all treatments containing Mn over than that of the control. Foliar spray with Zn 0.5% + Mn 0.3% was the superior in this respect. In addition, foliar spray with Zn 0.5%+Fe 0.3% and Zn 0.5%+B 0.1% significantly increased leaf Mn content over than that of the control. The residual effect was not noticeable in the following year.

7. Boron content:

The obtained data showed that leaf boron content was increased obviously by all micro-nutrient element solutions containing boron over all other treatments . There was no carry over effect on the following season.

C. Yield:

Generally, the obtained data showed that all treatments significantly increased yield over the control. Foliar spray with Zn 0.5%, Zn 0.5%+B 0.1% and Zn 0.5%+Fe 0.3% +Mn 0.3% + B 0.1% were the superior in this respect.

D. Fruit quality:

1. Average weight of cluster:

The obtained data disclosed that all treatments significantly increased the weight of cluster over than that of the control. Furthermore, foliar spray with Zn 0.5%+Fe 0.3% + Mn 0.3% + B 0.1% was the superior in this respect.

2. Average weight of 100 berries:

The obtained data showed that berries **of the control**

vines were statistically of the lightest weight .The highest value was obtained from Zn 0.5% + Fe 0.3% + Mn 0.3% + B 0.1% followed by Zn 0.5% + Mn 0.3% + B 0.1% and Zn 0.5% + B 0.1% treatments.

3.Juice volume of 100 berries:

The obtained data showed that Zn 0.5% or Zn 0.5% + Fe 0.3% + Mn 0.3% + B 0.1% treatments significantly increased juice volume of 100 berries over that of the control. On the contrary, the other treatments significantly decreased juice volume of 100 berries.

4.Weight of cluster stem:

The obtained data showed that all treatments investigated increased slightly the weight of cluster stem, but the differences were so small to reach level of significance.

5.Total soluble solids percent:

The data obtained showed that Zn 0.5% or Zn 0.5% + Fe 0.3% + Mn 0.3% + B 0.1% treatments induced berries contained the highest value of T.S.S.%. The increase in T.S.S% was highly significant as compared with those of the control or the other treatments.

6.Fruit juice acidity:

The obtained data showed that foliar spray either with Zn 0.5% or Zn 0.5% + Fe 0.3% +Mn 0.3% + B 0.1% significantly decreased acidity than that of the control.

7. Total soluble solids/ Acid ratio:

The obtained data showed that foliar spray either with Zn 0.5% or Zn 0.5% + Fe 0.3% + B 0.1% treatment **produced**

_berries showed the highest T.S.S./Acid ratio. Such increase was significant as compared with control or the other treatments.