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جامعة بغداد - كلية التربية
(ابن الهيثم)

تأثير حامض البرولين في تحمل نبات الماش

Vigna radiata L مدد التعطيش

رسالة مقدمة

إلى مجلس عمادة كلية التربية (ابن الهيثم) - جامعة بغداد
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بإشراف

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Abstract

A pot experiment was conducted in the botanical garden of the Department of Biology in the College of Education - Ibn al-Haytham / University of Baghdad, during the growing season 2010 to study the effect of increasing concentrations of proline acid (0,25,75,125) ppm on *Vigna radiata* plant tolerance to different periods of drought (0,2,4,6) days. Some morphological and physiological indicators and the effect of interactions between the periods of drought and proline acid in those indicators were studied.

A factorial experiment within a completely randomized design with 3 replications was adapted, the experiment included 48 pots, the capacity of each pot was (7) kg of soil brought from the Botanical Garden of the Department of Biology. Sixteen seeds were planted on 21/6/2010 in each pot, after 14 days, plants were thinned to 12 plants, and plants growth were watched up in the pots (experimental units).

Vegetative part was taken from six plants as the first sampling date (hervest) was taken after 58 days of seed planting designated here after as H₁-D₅₈ and the second sampling date was after 86 days designed here after as H₂-D₈₆.

Indicators of growth that plant length, dry weight, the absolute growth rate , relative growth rate, sustainability of biomass, and macroelement content like Nitrogen, Phosphorus, Potassium, Calcium and Magnesium, and microelement content like Iron, Zinc, Manganese, Copper and protein content in the Vegetative part of plant were determid. The content of total chlorophyll, soluble carbohydrates and the Proline acid were also studied. The results were analyzed statistically according to the design approach and the means were compared using a least significant difference at 0.05 probability level.

Results could be summarized as follow:

1 - Increasing duration of the drought influenced in growth indicators decrease under study, especially when a period of drought (6 days) compared with treatment drought as in plant length, a drop of 38.16%, and dry weight, drop level of 67.02% for the first hervest and 68.65% for the second harvest with the absolute growth rate decline of 73.31% and the average relative growth rate was 20.00% decline sustainability of biomass decline was similar to absolute growth rate. The content of macro elements content the rate of decline in the follow: N 80.37%, P

73.46%, K 75.25%, Ca 81.16% and Mg 84.41%, in the first harvest, compared with the control treatment, while in the second harvest the rate of decline of major elements was as the following :N 79.75% ,P 79.38% ,K 80.17% ,Ca 81.49% and Mg 84.24% compared with the control treatment, as well as the content of micronutrients the percentage decline in the rate of Iron content 46.89%, Zinc 58.12% , Mn 47.98% and Copper 45.45%, compared with the control treatment of the first harvest, while in the second harvest the decline rate was as the follow: Iron content 45.06% , Zinc , Manganese 49.43% 54.44% and Copper 31.25%, the protein content decreased by 39.14% and 35.75%,the total chlorophyll content increased by 32.25% and 38.05% soluble carbohydrates compared with the control treatment.

2 - The increase in concentration of proline acid significantly affected the increased values of the indicators under study, as it gave the Focus 75 ppm higher values of the dry weight of shoot, plant length, dry weight, growth absolute rate, relative growth rate, sustainability of biomass and the content of each of Nitrogen, Phosphorus, Potassium, Calcium and Magnesium in the vegetative part as well as the content of each of Iron, Zinc, Manganese, Copper, protein, carbohydrates dissolved and the content of total chlorophyll except content proline acid, while concentration of zero proline acid giving the lowest values, and gave concentration 125 ppm proline acid gives more values than the values of concentration zero and 25 ppm proline acid as the proline acid has an effective role in removing the negative impact of drought and stimulate vegetative growth of the plant, and it gave less values than the values of concentration 75 ppm, because high concentrations of proline acid inhibit the activity of growth hormones, for all the studied indicators mentioned above except the recipe content proline acid gave the concentration of 125 ppm values than the values of the other concentrations.

3 - Overlap between the drought duration and the concentrations of proline acid showed the effects in the indicators studied, under concentration of 75 ppm and none drought have given the highest values of the indicators, except the character content of the proline acid, where the highest value at the time of drought was 6 days and concentration 125 ppm of proline acid, The proline content increase under drought conditions in order to protect the plant from these circumstances, in addition to spray the plant by acid.

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Effect of Proline Acid on Tolerance of Mung Bean Plant (*Vigna radiata*) to Drought Duration

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