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SHORT COMMUNICATION

EFFECT OF B_9 ON FLOWERING AND YIELD OF COWPEA AND GRAM UNDER SALINE CONDITIONS

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Sand culture experiment was conducted to study the effect of salinity and B_9 spray on cowpea (*Vigna unguiculata* L.) and gram (*Cicer arietinum* L.). Salinity inhibited flowering and yield of both cowpea and gram(*Cicer arietinum* L.) the effect being more on latter. The plants of gram either did not survive or failed to flower or yield when the salinity level exceeded 15 me salts/l. Application of 500 ppm of B_9 increased the number of flowers, pods, seeds and seed test weight in cowpea both in control and saline treatments. While the same concentration of B_9 did not affect flowering and yield in control treatment of gram, it alleviated some of the deleterious affects of salinity on flowering and yield.

The yield of crop plants, particularly that of legumes, is severely affected by saline conditions (Siddiqui and Kumar, 1985; Sharma *et al.*, 1993). Application of growth retardants is reported to alleviate the deleterious effects of salinity in some plants (Halevy and Kessler,1963). However, contradictory reports are also available (Upadyaya *et al.*, 1981). This study deals with the effect of foliar application of B_9 (N, N dimethyl ammino succinamic acid) on flowering and yield attributes of cowpea and gram under saline conditions.

The plants of cowpea (*Vigna unguiculata* L.) var HFC-42-1 and gram (*Cicer arietinum* L.) var C.-235 were raised in sand culture. A mixture of salts was used for creating salinity so as to have Na, Ca and Mg in the ratio of 5.0 : 1.5 : 3.5 and Cl and SO_4 in the ratio of 8:2 on milliequivalent (me) basis. Three levels of salinity were prepared by the addition of 15, 45 and 75 me salt mixture per liter of Wilson and Reisenauer (1963) nitrogen free nutrient solution, giving final EC of 3, 6 and 9 ± 0.2 mmhos/cm at 25°C. The control plants received only the above nutrient solution having an EC of 1.5 ± 0.2 mmhos/cm. The pots were flooded with excess saline solution once a week till harvest to ensure equilibriation of salts in the root medium. The seeds were inoculated with the standard Rhizobial culture, CP-3 for Cowpea and CA-181 for gram. The plants were sprayed with 500 and 1000 ppm of B_9 twice at weekly intervals at two leaf stage. Ten uniform plants from each treatment were selected and labelled for recording the number of flowers produced. The time of flowering was taken as the number of days elapsing from sowing till 50% of the plants flowered. At maturity, the plants were harvested and the number of pods, weight of pods and seed test weight were determined.

The number of flowers in both cowpea and gram decreased due to salinity. However, the effect was more in the latter (Table I). The effect of different levels of salinity did not markedly differ in cowpea whereas gram plants could flower only up to salinity level of 15 me salts/l. At higher salinity levels, the plants either failed to survive or did not flower. Salinity did not affect the time of flowering in cowpea but delayed it in gram.

Table I: Effect of salinity and B_9 on the number of flowers and days taken for 50% flowering (values in parentheses) in cowpea and gram.

B-Nine (ppm)	Salinity-me salts/l			
	0	15	45	75
	Cowpea			
0	6.8 (64)	4.9 (66)	4.6 (68)	4.2 (68)
500	8.3 (65)	6.2 (68)	6.3 (68)	6.4 (66)
1000	6.1 (67)	5.2 (66)	4.1 (67)	4.2 (68)
C.D. at P = 0.05	0.4 (1.9)			
	Gram			
0	12.4 (102)	32 (106)	-	-
500	12.6 (100)	9.6 (100)	-	-
1000	19.4 (98)	-	-	-
C.D. at p=0.05	2.4 (2.1)			

- indicates that no flowering took place.

Application of 500 ppm of B_9 increased while 1000 ppm of B_9 decreased the number of flowers in cowpea both in control and salinity treatments. In addition, 1000 ppm of B_9 also delayed flowering. Similar inhibition of flowering by B_9 under saline conditions was also reported in cowpea by Sarin and Uprety (1965).

Application of 500 ppm, did not affect flowering of control plants in gram but increased the number of flowers with 15 me salts/1. B_9 at 1000 ppm increased the number of flowers markedly under non-saline conditions but inhibited flowering completely with salinity level of 15 me salts and above. The time of flowering in non-saline control was not affected by the lower concentration of B_9, but was hastened by the higher concentrations. However with 15 me salts/l even lower concentration of B_9 also resulted in early flowering.

In cowpea, the number of pods and seeds decreased with 45 and 75 me salts/l, but their weight decreased with 75 me salts /l. Salinity did not affect 1000 seed weight. The lower level of salinity significantly reduced all the yield attributes of gram. However, at higher salinity levels of 45 and 75 me salts/l, either the plants did not survive at

Table II: Effect of salinity and B_9 on various yield attributes of cowpea and gram (values in parentheses).

Attribute	Salinity-me salts/l												C.D. at 5%
	0			15			45			75			
	B-9 (ppm)												
	0	500	1000	0	500	1000	0	500	1000	0	500	1000	
Number of pods/plant	4.2 (14.6)	5.5 (14.8)	3.8 (16.6)	4.1 (8.3)	4.1 (11.5)	4.2 (-)	3.6 (-)	4.2 (-)	3.5 (-)	3.3 (-)	4.0 (-)	3.2 (-)	0.22 (2.07)
Weight of pods g/plant	1.49 (1.90)	1.93 (1.84)	1.43 (1.05)	1.42 (1.16)	1.89 (1.62)	1.41 (-)	1.56 (-)	1.90 (-)	1.58 (-)	1.13 (-)	1.41 (-)	1.19 (-)	0.107 (0.163)
Number of seeds/plant	19.1 (16.5)	21.5 (15.3)	16.0 (16.0)	20.3 (12.0)	22.7 (15.5)	21.0 (-)	15.9 (-)	20.5 (-)	17.2 (-)	13.8 (-)	15.5 (-)	12.6 (-)	1.20 (1.46)
Weight of seeds	1.17 (1.52)	1.43 (1.52)	1.06 (0.80)	1.09 (0.98)	1.40 (1.40)	1.02 (-)	1.03 (-)	1.45 (-)	1.14 (-)	0.82 (-)	1.04 (-)	0.85 (-)	0.088 (0.114)
1000 seed weight (g)	58.2 (92.3)	66.7 (99.1)	66.4 (50.4)	53.9 (82.5)	61.5 (90.0)	48.8 (-)	61.8 (-)	70.6 (-)	60.5 (-)	59.0 (-)	67.5 (-)	57.6 (-)	5.04 (7.16)

-indicates that no flowering took place.

all or did not produce any seed (Table II). Siddiqui and Kumar (1985) also reported reduction in the number of pods and seeds of pea under saline conditions.

In cowpea, both under saline and non-saline conditions, application of lower concentration of B_9 resulted in an increase in all the yield attributes except the number of pods. The increase in 1000 seed weight along with the number and weight of pods and seeds by 500 ppm of B_9 indicates a probable increased potentiality of both source and sink. Application of 1000 ppm of B_9 had no effect on the various yield attributes under saline conditions but under non-saline conditions, it decreased the number of pods and seeds and increased 1000 seed weight.

In gram, application of 500 ppm of B_9 had no effect under non-saline conditions but under saline conditions (15 me salts/l) it resulted in an increase in all yield attributes. Thus, 500 ppm of B_9 showed alleviation of deleterious effect of salinity. Application of 1000 ppm of B_9 had no effect on the number of pods and seeds per plant but decreased their weight under non-saline conditions. However, under saline conditions it alltogether eliminated the yield.

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