

RESEARCH NOTES :

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Effect of Benedyne on the Dry Matter and Extractable Protein Yields in Sunnhemp (*Crotalaria juncea* L.)

Benedyne is an organic liquid concentrate derived from controlled fermentation of natural organic matter. It is reported to contain various chemical substances including soil microorganisms and natural growth factors which make available greater quantities of mineral and micronutrients from the soil. Sinha and Gautham (1967) reported that it can be used as synthetic soil aggregate chemical and plant growth stimulant for enhancing the crop production from the studies on wheat. Subramanian *et al.*, (1970) studied the effect of Benedyne on Sunnhemp and found that the stimulant had appreciable effect on nodulation as well as in the fresh and dry weight of the nodule. The effect of Benedyne on the dry matter and the extractable protein yields in Sunnhemp is reported in the present communication.

Sunn hemp seeds were soaked overnight in 15, 30, 45, 60 ml Benedyne well mixed in one litre water. The seeds so treated were sown in adequately manured plots and the balance of Benedyne liquid was also applied to the respective plots.

A second application of Benedyne at the same concentration was made to the soil after 30 days. The treatments were randomised and replicated twice.

The plants were removed at flowering stage and the leaf protein was extracted by the simple method of extraction described by Pirie (1955) and Balasundaram and Samuel (1971). The dry matter and extractable protein yields were recorded and the mean values are presented in Table 1.

Table 1. Effect of Benedyne on the dry matter and extractable protein yields.

Treatment	Dry matter yield kg/ha	Extractable protein yield kg/ha
O	2450	118.13
15 ml/litre	2406	125.00
30 ml/litre	2380	125.63
45 ml/litre	3284	165.62
60 ml/litre	3787	216.57

The dry matter as well as the extractable protein yields were found to increase due to Benedyne treatments. On an average, the dry matter yields ranged from 2450 to 3787 kg/ha and the extractable protein yields from 118.13 to 216.57 kg/ha.

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Effect of pre-treatment of Bajra seeds on the total carbohydrates, reducing sugars, starch and RNA content of seedlings

Experiments were carried out to induce tolerance to drought in Bajra H-B 3 by pre-treatments indicated. The seedlings were raised in conventional germination trays with Hoagland solution uniformly. Samples from four replications were pooled and analysed at 8th, 15th, 22nd and 30 th day after sowing. Analysis were done by colorimetric method and the data are presented in the table.

The results indicated that there was increase in total carbohydrates in all pre-treatments particularly in Cycocel and Kinetin. Hardening and resistine although increased the values as compared to that of control, minimum effect was seen due to these treatments. The dwarfening agent Cycocel, maintained an increase of over 200 per cent on the control at every sample. From the present data it is clear that carbohydrates do not increase with capacity for drought tolerance.

Regarding reducing sugars, the content increased in case of pre-treated plants. Among the treatments, Cycocel was most effective followed by Kinetin. Ethrel and resistine had similar effects, while hardening had the least effect. Results similar to this have been reported by Chinoy (1965) and Misra *et al.*, (1968). Regarding the effect of Kinetin on the increase of sugar content Bachman *et al.*, (1966) reported that Kinetin caused inhibition on the oxygen uptake in barley thereby increased the sugar content.

Starch content of the plants raised from the pre-treated seeds with Cycocel and Kinetin was maximum throughout the period of study. Though there was a decrease as the seedlings grew, Cycocel and Kinetin treated samples showed maximum starch. Berridge and Ralph (1971) reported that Kinetin caused gross starch degradation. May and Milthorpe (1962) explained in their report "that with an increasing water deficit in plant tissues, the hydrolytic reactions tended to dominate resulting in sugar accumulation". The present investigations indicated that treatments with Cycocel and Kinetin delayed starch breakdown by delaying the amylase production.

All the treatments increased the RNA content as compared to the control. At all the stages, Cycocel followed by Kinetin was more effective than rest. Work done so far shows that Kinetin and ethylene increase or stimulate the synthesis of RNA in many plants. The effect of Kinetin thus appears to operate directly and is not dependent upon the accumulation of metabolites from untreated tissues. Gates and Bonner (1959) observed that moisture stress suppresses net increase in RNA of leaves in tomato. West (1962) on the other hand reported RNA accumulation in seedling grown under water stressed conditions. Tvorus (1970) observed an increase in ribonuclease activity by pre-hardening in leaves of maize.

Effect of treatments on total carbohydrates, reducing sugars, starch and RNA content in seedlings

Tt. No.	Treatments	I 8				II 15				III 22				IV Stages 30 days			
		Percentage		$\mu\text{g}/\text{mg}$		Percentage		$\mu\text{g}/\text{mg}$		Percentage		$\mu\text{g}/\text{mg}$		Percentage		$\mu\text{g}/\text{mg}$	
		CHO	R Starch Sugar	RNA	CHO	R Starch Sugar	RNA	CHO	R Starch Sugar	RNA	CHO	R Starch Sugar	RNA	CHO	R Starch Sugar	RNA	CHO
C.	Control	1.35	0.34	8.73	2.5	1.50	0.45	8.10	4.0	4.50	0.58	7.65	19.4	6.90	0.66	6.75	33.5
T ₁	Hardening	1.50	0.39	9.00	3.2	1.75	0.46	8.28	5.0	5.50	0.60	8.10	19.6	8.75	0.69	7.55	49.0
T ₂	CCC-5 ppm	3.00	0.46	13.60	5.4	3.25	0.60	10.98	6.2	9.90	0.68	9.99	20.8	14.00	0.80	8.73	51.6
T ₃	Ethrel-5 ppm	2.50	0.40	9.45	4.0	2.75	0.60	8.55	5.9	8.50	0.61	8.37	20.6	10.50	0.70	7.60	39.0
T ₄	Kinetin-5 ppm	2.50	0.44	10.80	4.7	3.00	0.55	9.99	6.0	9.00	0.67	9.72	20.8	12.50	0.76	8.10	49.0
T ₅	Resistene-10 ppm	1.75	0.41	10.53	3.5	1.85	0.53	9.63	5.6	6.00	0.67	9.45	20.6	10.00	0.72	7.65	49.0

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