

Effect of NPK on Growth and yield of Fox-glove (*Digitalis lanata* Ehrh.)

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A study on the manurial requirement of Fox-glove (*Digitalis lanata* Ehrh.) was conducted with four levels of N (0, 30, 60 and 90 kg/ha), two levels of P (30 and 60 kg/ha) and one level of K (30kg/ha). observations on the number of leaves, length and breadth of leaves and yield of dry foliage showed that application of NPK at the rate of 60, 30 and 30kg per hectare as basal application significantly showed the greater response. There was not much variation in the total glycosides content among the treatments.

Digitalis, a native of Western Europe and UK (Wallis, 1946) has been introduced into India and its commercial cultivation taken up in Kashmir and in a limited area in South Indian hills at an elevation of 6000-7000 feet. Many species of *digitalis* are the important sources of natural glycosides extensively used in medicines (for regulating heart activity, stimulating the cardiac action and act as powerful diuretic and in generalised oedema). Among them *Digitalis lanata* and *D. purpurea* are the most important.

The leaves of *D. lanata* contain three glycosides namely digitoxin, gitoxin and digoxin, (Gather-coal and Wirth, 1947). Since the cardiac glycosides obtained from various species of *digitalis* have so far not yet been synthesized, cultivation of *D. lanata* is the only source left to meet the requirement of the pharmaceutical industry. As such, improved agro techniques have to be adopted to increase the production of this glycosides. Application of major nutrients will help to maximise the productivity.

A fertilizer dose of 30-40 kg of N, 8-10 kg of superphosphate per hectare was recommended by Greezlov (1952) for the *digitalis* under Moscow conditions. Singh (1960) opined that 50 kg of calcium nitrate and 100 kg of P_2O_5 per hectare was optimum for increasing the growth under similar conditions. However the optimum nutritional requirements of *digitalis* under upper Pulney hills, have not so far been studied. Hence, the present investigation was undertaken with the object of standardising the optimum levels of N, P and K to maximise the yield in *digitalis*.

MATERIAL AND METHODS :

The investigation was carried out at Horticultural Research Station Kodai-kanal during the years 1976-1980. The experimental plots were slightly acidic (pH 6.0) with low to medium available N and low available P and K. The treatments included four levels of N (0, 30, 60 and 90 kg/ha), in

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combination with two levels of P (30 and 60 kg/ha) and one level of K (30 kg/ha). The experiment was laid-out in a Randomized block design consisting of eight treatment combinations with four replications. The entire doses of the fertilizers in the form of urea, superphosphate and muriate of potash were applied basally at the time of planting.

The seeds were sown in the raised nursery beds and thirty day old seedlings were transplanted at a spacing of 45 cm X 30 cm in a nett plot size of 1.80 m X 1.50m. The observations on number of leaves, length and breadth of leaves and dry foliage yield were made 180 days after planting. The leaf samples were analysed for the total glycoside content (A. O. A. C. 1960). The data were subjected to statistical analysis following the methods suggested by Snedecor and Cochran (1967).

RESULTS AND DISCUSSION :

Data on the morphological characters, foliage yield and total glycoside content are presented in Table.

i) *Number of leaves* : The results indicated that the application of 60 kg of N, 30 kg of P and 30 kg of K/ha significantly registered the large number of leaves (63.95) per plant. This was closely followed by the treatments N 60, P 60 and K 30 kg/ha and N 90, P 30 and K 30 kg/ha recording 60.90 and 60.40 leaves respectively and these treatments were on par with each other. The least number of 35.80 leaves were recorded by the

treatment N 0 P 30 and K 30 kg/ha (control).

ii) *Leaf length* : The same treatment of N 60, P 30 and K 30 kg/ha has also registered the greater leaf length of 17.28 cm as compared to other treatments. Minimum leaf length of 9.50 cm was recorded by the control (N 0 P 30 K 30 kg/ha).

iii) *Leaf breadth* : Greater leaf breadth of 3.24 cm was recorded by the application of 60 kg of N, 30 kg of P and 30 kg of K per hectare and was significantly superior to all other treatments. The leaf breadth was least in the control (2.08 cm).

iv) *Foliage Yield* : Regarding the dry foliage yield also, the treatment N 60, P 30 and K 30 kg/ha significantly recorded the highest yield (1703.70 kg/ha) followed by the treatments N 30, P 60 and K 30 kg/ha and N 60, P 60 and K 30 kg/ha recording 1025.93 and 1014.82 kg of dry foliage yield respectively. The treatment N 0, P 30 and K 30 kg/ha (Control) recorded the lowest yield of 333.33 kg/ha. The treatment N 60, P 30 and K 30 kg/ha recorded the highest values for various yield components namely number of leaves, leaf length and breadth which in turn has resulted in the highest foliage yield.

v) *Total Glycoside content* : With regard to total glycoside content, even though there was not much variation among the treatments tried, application of 30 kg each of N, P and K per hectare recorded the highest content (0.320 per cent) as compared to control recording 0.305 per cent.

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- * Original not seen.

TABLE Effect of NPK on the Growth and yield of *Digitalis lanata* (Mean of four replication)

Treatment	Morphological characters			Yield of Dry foliage		Total glycoside
	Leaf Number	Leaf Length (cm)	Leaf breadth (cm)	kg/plot	Kg/ha	content (%)
N ₀ P ₀₀ K ₀₀	35.80	9.50	2.08	0.090	333.33	0.305
N ₀ P ₆₀ K ₀₀	40.93	11.69	2.87	0.145	537.03	0.305
N ₂₀ P ₃₀ K ₀₀	45.33	14.67	2.99	0.233	862.96	0.320
N ₂₀ P ₆₀ K ₀₀	52.78	15.93	2.86	0.277	1025.93	0.310
N ₂₀ P ₈₀ K ₀₀	63.95	17.28	3.24	0.460	1703.70	0.310
N ₆₀ P ₀₀ K ₃₀	60.90	15.72	3.18	0.274	1014.82	0.305
N ₆₀ P ₃₀ K ₃₀	60.40	15.28	3.12	0.240	888.88	0.315
N ₆₀ P ₆₀ K ₃₀	58.13	15.54	3.14	0.232	859.26	0.310
S. E.	5.09**	0.69**	0.17**	0.027**	—	N.S.
C. D.						
(P=0.05)	14.98	2.04	0.50	0.078	—	—

** Significant at 1% level

N.S. Non-Significant.