TECHNICAL NOTE NO. 58

FERTILIZATION OF NATIVE RANGE GRASSES IN SUBTROPICAL HUMID ZONE AT BALAKOT AND JABA

M. I. Sheikh and S. M. Khan*

In order to assess the effect of fertilizers on grass ranges some studies have been conducted at Balakot and Jaba using N, P and K alone or in combinations. The data collected gave encouraging results indicating positive cost benefit ratio. These studies, conducted by Dr. S.M. Khan and his group are described below:

Balakot

Four fertilizer treatments, namely control, 50 kg. of nitrogen per hectare in urea, 50 kg. of phosphorus per hectare in single superphosphate and 50 kg. N. 50 kg. P per hectare in urea and single superphosphate were applied to range vegetation in sub-tropical humid zone at Balakot village of Mansehra District. Nitrogan and phosphorus mixture doubled total forage and grass production and many times increased the production of desirable species, and undesirable species, *Chrysopogon aucheri* and *Cymbopogon martini*. However, both nitrogen and phosphorus when applied separately had no effect on the production of total forage, grass, any palatability class or any important forage species. No fertilizer treatment appreciably affected the forage production of intermediate species, *Themeda anathera* and *Heteropogon contortus*.

The effect of fertilizer on forage production is presented below:

Airdry forage yield (kg./ha)

Fertilizer	Block					
	1	2	3	4	5	Average
Control	1573	1657	1050	1217	1543	1408
Nitrogen	2093	1627	1263	1683	1460	1625
Phosphorus	1607	1567	2080	2333	1713	1860
Nitrogen + Phosphorus	2977	2843	3520	3067	2873	3056

Jaba

Nine fertilizer treatments were applied to range vegetation in subtropical chir pine zone and Jaba Sheep Farm of Mansehra District.

* The authors are Research Officers at the Pakistan Forest Institute, Peshawar.

T_1	N_0P_0	Control
T_2	N_1P_0	50 kg of nitrogen per hectare
T_3	N_2P_0	100 kg of nitrogen per hectare
T_4	N_0P_1	50 kg of phosphorus per hectare
T_5	N_1P_1	50 kg N + 50 kg P per hactare
T_6	N_2P_1	100 kg N + 50 kg P per hectare
T_7	N_0P_2	100 kg of phosphorus per hectare
T_8	N_1P_2	50 kg N + 100 kg P per hectare
T_9	N_2P_2	100 kg N + 100 kg P per hectare

Nitrogen alone increased the grazing capacity slightly, phosphorus alone increased it more, while nitrogen and phosphorus mixture increased the grazing capacity much more. 50 kg N + 50 kg P per hectare doubled the grazing capacity. The grazing capacity was not significantly increased over 50 kg. N + 50 kg P per hectare by increasing either N or P or both from 50 kg per hectare to 100 kg per hectare. The above indications are borne out by the following table:

Airdry forage yield (kg/ha)

Treatments		Replications					Average
		R1	R2	R3	R4	R5	
T_1	N_0P_0	2540	2093	1757	2237	1873	2100
T_2	N_1P_0	2507	2470	4073	1540	1690	2456
T_3	N_2P_0	2243	2527	2207	3360	2947	2657
T_4	N_0P_1	2743	3177	2720	2603	1673	2583
T_5	N_1P_1	3250	3213	3417	5037	5393	4060
T_6	N_2P_1	3857	3553	3790	4017	5433	4130
T_7	N_0P_2	2203	2927	2953	6030	2793	3381
T_8	N_1P_2	3340	2007	4823	4217	3407	3559
T_9	N_2P_2	5243	3673	2940	5423	4247	4305

Economics

The increase in the annual forage production by the application of 50 kg/ha of nitrogen in urea and 50 kg/ha of P_2O_5 in single super-phosphate was 1648 kg at Balakot and 1960 kg at Jaba. The cost of 2.2 bags of urea and 5 bags of single super-phosphate comes to about Rs. 450. The cost application of fertilization in one ha would be about Rs. 50 i.e. 2 labours each at Rs. 25 per day. The cost of production of about 1648 kg of air dry forage at Balakot and 1960 kg of air dry forage at Jaba is about Rs. 500. The sale price of air dry forage in these areas is about Re. 1 per kg. The economics is given as under:

Balakot

Cost	—	500		
Benefit	—	1648		
B/C ratio	—	$\frac{1648}{500}$	=	3.3

Jaba

Cost	—	500		
Benefit	—	1960		
B/C ratio	—	$\frac{1960}{500}$	=	3.9

As is evident from the data, fertilization of pastures in the Himalayas is practicable as well as productive.