INTRODUCTION TRIALS OF RANGE PLANTS AT SARI, SUB-ALPINE ZONE

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Summary. *Out of ten exotic species/ecotypes sown at Sari (Kaghan) in May, 1977 at moderate slope on eastern aspect nine germinated. The percent cover and forage production of* Trifolium pratense *and* Vicia sativa *was significantly greater in October 1977, compared to other species. The difference in the number of plants of species established did not show any significance.*

Study area. Sari is situated in the sub alpine zone, 7 km southeast of Shogran, at an elevation of 2900 metres. Growing season is from April to October. The soil is shallow and has a moderate amount of organic matter suitable for plant growth. Annual average rainfall is about 1,000 mm and snowfall 500 cm.

Method. The following 10 species/ecotypes were sown in the last week of May, 1977 in a randomised block design, replicated 3 times. Sowing was done in 1 x 0.5 metre patches spaced at 1 x 2 metres. The patches were made by working the soil upto a depth of 50 cm. A depression of about 15 cm was made to hold the water. Seed was sown in 3 lines in each patch at a depth of 1.5 cm. Five patches sown to each species formed the unit of replication.

R.M. No.	*Species*	*Source*
306	*Lolium multiflorum*	Poland
334	*Lolium perenne*	Oregan
223	*Lotus corniculatus*	F.A.O. Rome 11046
206	*Medicago sativa*	Williamsburg
131	*Medicago sativa*	F.A.O. Rome 4933
222	*Phalaris tuberosa*	Anderson (Australia)
281	*Phleum pratense*	Tivothy
370	*Potarium sanguisorba*	Anatolia/Turkey
187	*Trifolium pratense*	Chesapeake
214	*Vicia sativa*	Warrior

Average percent cover and number of plants of each species were also recorded on each plot. In October 1977, one of the five patches for each species in each replication was taken at random by drawing lots for determining forage production. Green and air dry weights were recorded for the clipped material. Airdry weights were converted for forage production per hectare by multiplying with 20.

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Trifolium pratense (187) Introduced at Sari—May 1977, observations—Oct. 1977

Vicia sativa (214) introduced at Sari—May 1977, observations—Oct., 1977.

Analysis of variance was done to determine significant differences in percent cover, number of plants and forage production and Duncan's multiple range test to determine the difference of means.

Results and discussion. *Medicago sativa, Potarium sanguisorba, Lotus corniculatus* and *Phalaris tuberosa* were in vegetative growth stage, while *Trifolium pratense, Vicia sativa, Lolium multiflorum* and *Lolium perenne* were in flowering and fruiting stage. *Phleum pratense* did not germinate.

Establishment: The average number of plants established in each group of five patches for different species is given below:

No. of plants established

Species	Replication			Mean
	I	II	III	
Lolium multiflorum	84	47	24	52
Lolium perenne	8	21	27	22
Lotus corniculatus	21	36	46	34
Medicago sativa (206)	27	68	49	48
Medicago sativa (131)	27	87	37	50
Phalaris tuberosa	84	38	31	51
Potarium sanguisorba	82	88	74	81
Trifolium pratense	38	59	30	42
Vicia sativa	18	52	43	38

There was no significant difference in the number of plants established.

The percent cover: As indicated by the following data, *Trifolium pratense* and *Vicia sativa* have significantly better % cover (0.5 level, Duncan's New Multiple Range Test as compared to the other species.

Percent cover

Species	Replication			Mean
	I	II	III	
Lolium multiflorum	28	19	22	23
Lolium perenne	8	7	9	8
Lotus corniculatus	6	6	9	7
Medicago sativa (206)	10	12	6	9
Medicago sativa (131)	9	10	6	8
Phalaris tuberosa	21	10	8	1
Potarium sanguisorba	25	1	17	20
Trifolium pratense	79	25	67	57
Vicia sativa	19	55	39	37

Forage production: The forage production of *Trifolium pratense* and *Vicia sativa* was significantly greater than all other species (0.5 level, by Duncan's New Multiple Range Test).

Forage production kg/ha—calculated

Species	Replication			Mean
	I	II	III	
Lolium multiflorum	600	1000	1620	1070
Lolium perenne	160	540	600	433
Lotus corniculatus	40	100	120	87
Medicago sativa (206) (FAO Rome)	80	180	100	87
Medicago sativa (131) (Williamsburg)	120	160	120	134
Phalaris tuberosa	160	260	200	207
Potarium sanguisorba	200	340	260	267
Trifolium pratense	2350	500	2040	1630
Vicia sativa	480	3600	1000	1693

Yield from one plot 1×0.5 converted into kg/hectare by multiplying with 20.

Conclusion: *Trifolium pratense* and *Vicia sativa* showed a rapid growth and matured before the start of winter season. The two species outyielded all other species under trial *Lolium multiflorum* was the next best. These can be introduced in the area to advantage.

Lolium multiflorum (306) Introduced at Sari—May 1977, observations—Oct. 1977.