Effect of different seeding rate of sainfoin and nitrogen fertilization on productivity of degraded rangelands in Kyrgyzstan

Kenesh Joldoshev

Agriculture

- Arable agricultural land of Kyrgyzstan is 10.6 million and out of them 9.7 million ha or 87% is pasture and natural rangelands

Agriculture

- Total area of pasture of Chuy province is 859 thousand hectare including spring-autumn 292 thousand hectare and average yield is 8,1 quintals/ha, winter – 119 thousand hectare and yield is 3,6 quintals/ha dry mass; hayfield is 86 thousand ha, yield 15-17 q/ha. And the rest of pasture is used as summer pasture.
- Prepared forage in irrigated lands and natural hayfield can be provided 50-80% of total required fodder at Alymseyit and Kenesh farm. During summer period the sheep flocks are grazed on natural rangelands on high mountain areas.

Climatic conditions

- Climate of Kyrgyz Republic is sharply continental. The climate can be changed not only by decades base but within round clock especially in the mountain areas.
- Air temperature is substantially increasing and at the same time rainfall is decreasing during last years. For example, according to data of Tokmok meteo station which is located 30 km from experimental site where we provided the experiments for the last three years.

Precipitation and average monthly air temperature of Chuy and Kemin districts for the 2007-2009 гг. (Tokmok meteo station).

	Months												Aver age
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
Average monthly air temperature													
Average long term	-5,0	-2,2	4,3	11,4	16,7	20,7	23,1	21,7	16,4	9,7	2,5	-2,4	9,7
2007	-0,8	2,0	4,4	15,5	17,8	23,4	24,8	23,3	18,8	8,6	6,1	-4,6	11,7
2008	-10,4	-3,1	11,3	13,6	20,7	25,2	26,3	24,7	17,6	10,9	5,1	-0,7	13,5
2009	-1,0	1,5	7,8	11,1	16,7	21,3	24,3	22,9	16,8	-	-	-	13,5
Rainfall, (mm)													
Average long term	27	34	59	77	77	50	23	17	18	37	42	35	496
2007	10,5	21,4	41,5	59,0	88,1	20,6	25,8	19,3	2,0	14,6	51,0	26,6	379,4
2008	5,4	34,5	43,1	28,6	33,6	20,2	16,8	3,9	11,6	70,9	38,2	23,8	330,6
2009	18,3	41,5	45,1	139, 2	87,0	12,4	3,9	12,1	32,8	-	-	-	392,3

Remarks: data for 2009 is only 9 months

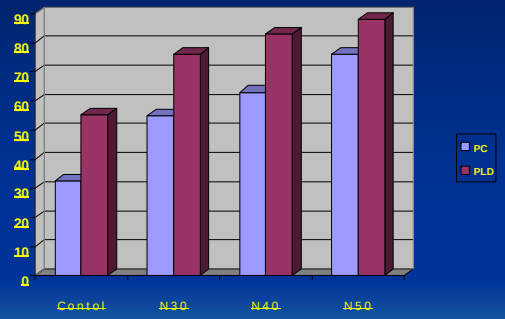
Results

- Plant vegetation and height are the main factor influencing on hayfield plant cover and productivity development. Rainfall and nitrogen application were positvely affect to the plant height and the plant height was 50-85 cm. And, in control variant bluegrass plant height was 40.4 cm, Kentucky bluegrass – 50.3, wheat grass 51.2 cm, шалфей лекарственный – 49,7 cm, sainfoin – 70,1 cm, and nitrogen application at 50 kg/ha their height was reached to 32 до 85 cm.

Effect of nitrogen application on plant height, cm

№	Plant name	Treatments			
		Control	N30	N40	N50
1	Мятлик живородящий	40,4	45,6	73	82
2	Эспарцет	70,1	70,0	70,5	85
3	Мятлик луговой	50,3	57	-	69
4	Шалфей лекарственный	49,7	53	-	55
5	Вьюнок обыкновенный	51,6	56	-	63
6	Пырей бескорневищный	51,2	61,2	73	85
7	Душица обыкновенная	31,1	30,7	26,8	32
8	Осока Туркестанская	-	41,2	50,3	56
9	Райграс пастбищный	-	40,3	49,2	54

Plant cover and plant density at different nitrogen rate



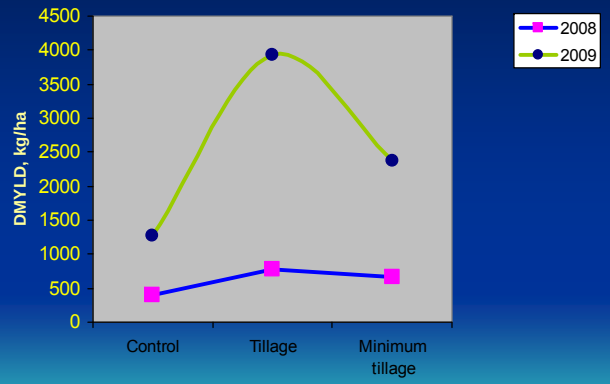
Effect of different norms of nitrogen application on productivity of hayfields

№	Treatments	Yield, q/ha	addition	
			q/ha	%
1	Natural hayfield (control)	12,8	-	-
2	Control + N 30 kg/ha	18,1	5,3	41,4
3	Control + N 40 kg/ha	23,7	10,9	85,1
4	Control + N 50 kg/ha	25,5	12,7	99,2

Effect of disking and tillage on oversowing sainfoin (2008-2009).

№	Treatments	Plant height	Plant density
1	Natural hayfield (control)	-	
2	Control+oversowing sainfoin (tillage)	93,4	106,4
3	Control+oversowing sainfoin (minimal tillage)	71,8	87,1

Effect of disking and tillage on oversowing sainfoin (2008-2009).



Effect of oversowing at different sowing rates on productivity of natural hayfields

Treatments	yield, q/ha	+-		Plant height, cm	Plant density m2
		q/ha	%		
Control (natural hayfield)	13,4	-	-		-
Control + sainfoin 50 kg/ha	22,9	9,5	70,9	66,2	63
Control + sainfoin, 70 kg/ha	24,4	11,0	82,0	66,7	85

Conclusions and recommendations.

- On the basis of above mentioned results following conclusions can be made:
- Natural hayfield can be used starting from April through end of May and also after September month.

Conclusions and recommendations

- Yield productivity of natural hayfields depending on climatic conditions especially rainfall. When rainfall is less at the same productivity of hayfield will be also less.
- Hayfield productivity will be increased with sowing and oversowing.
- Application of nitrogen at rate 50 kg will increase hayfield productivity by almost two times.


Thank you very
much your attention!