



University of Kentucky
UKnowledge

International Grassland Congress Proceedings

XXI International Grassland Congress / VIII
International Rangeland Congress

Effect of Using Cultivated Forages on Herder's Income in Three Types Grassland Ecological Zones

Limin Hua
Gansu Agricultural University, China

Lian Yang
Gansu Agricultural University, China

David Michalk
Department of Primary Industries, Australia

Jianping Wu
Gansu Agricultural University, China

Follow this and additional works at: <https://uknowledge.uky.edu/igc>



Part of the [Plant Sciences Commons](#), and the [Soil Science Commons](#)

This document is available at <https://uknowledge.uky.edu/igc/21/19-1/13>

The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.

Effect of using cultivated forages on herder's income in three types grassland ecological zones

Hua Limin^{1,2}, Yang Lian^{2*}, David Michalk³ and Wu Jianping²

¹The World Bank Financed Gansu Pastoral Development Management Office, 730000; ²Gansu Agricultural University, Lanzhou, China, 730070, * corresponding author, E-mail: yangl@gsau.edu.cn; ³New South Wales Department of Primary Industries, NSW 2800 Australia

Key words: forage cultivation, grassland degeneration, herder's income, animal production efficiency

Grassland degradation has caused environmental damage and reduction in animal production (Yang, 2002). The Chinese government has introduced a grazing ban and promoted rest policies as the first step to restore grassland condition. The challenge for policy implementation was to maintain herder's income and at the same time reduce the number of animals grazing grassland. The objective of our study was to evaluate the impact of cultivated forages on managing grassland rehabilitation in western China by funding typical herders to plant additional forages in three different grassland ecological zones.

Material and methods The following three grassland ecological zones were selected as study sites. 1) *Montane Desert-grassland* site in Liangzhou district, and goats was the main livestock enterprise. 2) *Desert steppe-grassland* site in Subei Mongolian Autonomy County, local herders mainly raised cashmere goats and sheep. 3) *Temperate steppe* site in Anding district, sheep was the main livestock enterprise. Demonstration households (DHs) funded to plant forage and control households (CHs) were selected from typical households in each grassland zone.

Table 1 The increase of livestock production efficiency by forage cultivation.

Study site	Household type	Forage species	Animal type	Fiber yield (kg/hd)	Average carcass weight(kg)
Liangzhou	DHs	<i>Naked barley, millet, barley</i>	Goat	0.89	16
	CHs	<i>millet, barley</i>	Goat	0.73	12
Subei	DHs	<i>Alfalfa, Astragalus adsurgens, Vetch</i>	Sheep	3.08	40
			Goat	0.37	28
	CHs	Nothing	Sheep	2.53	38
			Goat	0.33	26
Anding	DH	<i>Sainfoin, Sorghum, Oat</i>	Sheep	-	18
	CH	<i>Sainfoin, Sorghum</i>	Sheep	-	15.2

Results The results from three grassland ecological zones all showed that the livestock production efficiency (Table 1) could be improved and at the same time stocking rate (Figure 1) decreased by growing livestock forage. The Liangzhou results showed that it increased cashmere yield and carcass weight per goat by 22% and 33%, respectively, in DHs relative to CHs, these increases resulted in 27% higher income/goat in the DHs and indicated that stocking rate could be reduced by 21% in DHs and generates the same total income as in CHs. The Subei results showed that the average carcass weight of sheep and goat was 5.3% and 7.7% higher than in control, wool yield per sheep and the cashmere yield per goat was 21.7% and 12.1% higher than in control respectively, and the expenditure to buy forage for supplementary feeding in winter of CHs increased 2.2 times compared with DHs, these meant that DHs could maintain the same income as CHs with 25% fewer sheep and 10% fewer goats. The results from Anding were similar to the result for Liangzhou, forage cultivation could improve herder's income effectively and the number of sheep decreased 16% in DHs and still generates the same income as CHs.

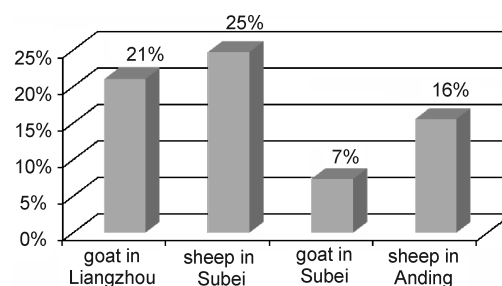


Figure 1 Decreasing stocking rate by forage cultivation.

Conclusions Forage cultivation can substantially improve production efficiency and effectively reduce grassland degradation of western China by decreasing the number of SUs but maintaining household profitability, the level of improvement was different for the three ecological zones, ranging from 7% to 27%. In predominantly pastoral areas, the land for growing forage is limited, such linkage between pastoral and cropping areas is crucial for the sustainable livestock development in western China and the reduction in environmental damage.

Reference

Yang Rurong, 2002, Analysis on the reason of grassland degeneration and sustainable development in western of China. *Pratacul Tural Science*, 19(1), 23-27.