Saltbush Alley Cropping Effects on Crop and Livestock Production On-Farm in the Dry Areas of Northern Syria

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The 21st International Grassland Congress / 8th 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

Presenter Information
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Key words: Awassi sheep, Barley stubble grazing, Farmers perceptions

Introduction Low and erratic rainfall, overgrazed rangelands, and declining soil productivity due to continuous cereal cropping and extension of cropping into marginal lands threaten livelihoods of smallholder agro-pastoral farmer in dry areas of Central and West Asia and North Africa. Saltbush (*Atriplex* spp.) alley cropping (SBAC) has potential to improve crop and livestock outputs and conserve the environment (Shideed et al 2005), but farmer adoption of the technology is low partly due to limited participatory evaluation of the technology with farmers. This aimed at comparing crop and livestock production under SBAC and continuous barley (CBC) cropping systems, and document farmers perception on the technology.

Materials and methods Saltbush (*Atriplex halimus*) alley cropping (SBAC) was compared with continuous barley cropping (CBC) on 21 farms in 7 villages in the Khannaser Valley in north-east Syria with average annual rainfall of 210 mm during 1996-2003. Farmlands, 1-4 ha in size were divided into two equal parts. One portion of the land was planted to 12-month old saltbush seedlings were planted in rows 10 m apart, with 2 m between seedlings within each row in spring (March-April) and seedling protected from grazing during the first season. Barley was seeded at 120 kg/ha between the saltbush hedgerows and on the land without saltbush each cropping season (October-May). Barley grain and straw, and saltbush foliage yields were estimated. The stubble in the SBAC and CBC systems on each farm was grazed for 16-60 days during May-July each year by Awassi sheep flock. Liveweight of each sheep was recorded before and after grazing. Farmers perceptions on the SBAC were recorded during field days and farm visits.

Results Yields of barley yield (Table 1) and growth rates of Awassi sheep (Table 2) grazing stubble in the SBAC system were significantly greater than the CBC system. Farmers perceived provision of additional forage without reducing barley yields, green feed during summer period, higher growth rate of sheep grazing the saltbush and stubble; and the potential of saltbush to provide shade, fuel-wood, serve as wind-breaks and demarcate farm boundaries as strengths of the SBAC technology. High establishment cost, lack of saltbush seedlings, difficulties of controlling grazing by trespassing sheep, and high water requirement by sheep grazing saltbush due to the high salt content were identified by farmers as the major weakness.

Table 1 *Barley grain and straw yields (kg/ha) in continuous barley (CBC) and saltbush-barley alley (SBAC) cropping systems on 21 farms over six years.*

	CBC	SBAC	s.e.m
Grain	566[b]	669[a]	34.1
Straw	769[b]	902[a]	38.5
Total biomass	1336[b]	1601[a]	70.3

Means in a row with different superscripts differ ($P<0.10$).

Table 2 *Forage-on-offer (kg/ha) and daily gain (g/head) of Awassi sheep grazing stubble in continuous barley (CBC) and saltbush-barley alley (SBAC) cropping systems on 21 farms over six years.*

	CBC	SBAC	s.e.m
Forage-on-offer	986[a]	1057[a]	53.1
Daily gain	111[b]	130[a]	10.5

Means in a row with different superscripts differ ($P<0.10$).

Conclusions Saltbush alley cropping has potential to increase land productivity in non-tropical dry areas. Enabling policies and institutions are to overcome the weakness of the technology could increase farmer adoption.

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