1. SESBANIA SESBAN

Extent of adoption

Kwesiga et al (1999) carried out a study on *Sesbania sesban* improved fallows in eastern Zambia. The study shows that farmers' interest in improved fallows was overwhelming after initial results showing that sesbania fallows increased maize yields without fertilizers. During the 1996/97 planting season, the number of farmers testing improved fallows increased from about 1000 to 3023.

Mekoya et al (2008) studied farmers' perceptions about exotic multipurpose fodder trees and constraints to their adoption across districts in Ethiopia. The study interviewed 235 farmers from three districts. The findings show that the majority of farmers (89.8%) were interested to either continue or begin fodder tree development. Of the interested respondents, 44.5% preferred local fodder trees whereas 55.5% preferred exotic multipurpose fodder tress. The study also found that 88.8% of adopters planted Sesbania, 8.8% Calliandra, and 2.5% Leucaena.

A study by Mudhara et al (2003) on the potential for adoption of *S.sesban* improved fallows in Zimbabwe indicates that there is potential for adoption of sesbania improved fallows in Zimbabwe under the economic conditions that prevailed during 2001.

Economics of production

Mafongoya & Dzowela (1999) carried out an experiment in Zimbabwe to evaluate biomass production of tree fallows and their residual effect on maize. Maize yield data from research conducted were used in the study. The study found that improved fallows increased the yields of post-fallow maize (Table 1).

Table 1: Yield of two years maize crops after *S. sesban* fallows of different duration in Domboshawa Training Center in Zimbabwe.

Fallow duration (Year)	Maize grain yield (Mg/ha)[a]			
	With no Fertilizer		With Fertilizer	
	Year 1	Year 2	Year 1	Year 2
1	3.8	3.9	4	4.1
2	4	5.1	3.9	5.3
3	3.1	5.6	5.3	6.5

[a]Average maize yield on farmer's field= 1.60 Mg/ha (standard deviation= 1.58 Mg/ha)
Source: Mafongoya & Dzowela 1999

Phiri et al (1999) carried out three-year researcher-designed and farmer-managed study on maize and sesbania production in relay cropping at three landscape positions in Malawi. The study found that the maize crop appeared to benefit from the association with sesbania because maize grain yields were consistently higher in the maize–sesbania intercrop than with sole maize. The results also show that at lower landscape positions, increases in applied sesbania biomass result in increased maize grain yields.

Kwesiga and Coe (1994) carried out a study on the potential of short rotation sesbania fallows in Eastern Zambia. Field studies conducted on-station since 1987 showed that sesbania improved fallows had a great potential to increase maize yields with or without application of mineral fertilizers. Maize grain yields of 5.0 and 6.0 Mg ha^{-1} were obtained in 1990 and 1991 following two- and three-year sesbania fallows, respectively (table 2). This compared to 4.9 and 4.3 Mg ha^{-1} from continuously cropped maize with fertilizer (112 kg N ha–1) and 1.2 and 1.9 Mg ha^{-1} without fertilizer. The fallows had strong residual effects on maize yields, and total yield in the four cropping seasons following the two year fallow was 12.8 Mg ha^{-1} compared to 7.6 Mg ha^{-1} for six seasons of continuous unfertilized maize. In addition, 15 and 21 Mg ha^{-1} of fuelwood were harvested after two- and three-year fallows, respectively.

Table 2: Maize grain yield following 1, 2, 3 year sesbania as compared with continuously cropped maize with different levels of fertilizer at Chipata in eastern Zambia.

Fallow duration (year)	N Fertilizer (kg ha^{-1})	Maize grain yield (Mg ha^{-1})					
		1988	1989	1990	1991	1992	1993
0 (control)	0	1.8	1.6	1.2	1.9	0.2	0.9
0 (control)	112	6.5	6.1	4.9	4.3	1.8	5.8
1	0	F(10)[a]	2.3	3.8	4.4	0.4	1.5
1	112	F	6.7	6.0	6.7	0.5	5.7
2	0	F	F (15)[a]	5.0	5.6	0.5	1.7
2	112	F	F	7.2	7.9	0.5	5.4
3	0	F	F	F (21)[a]	6.0	0.9	1.7
3	112	F	F	F	7.4	0.9	6.2

[a] denotes fuelwood production in Mg ha-1 from sesbania fallow
Kwesiga and Coe 1994

Further reading

Kwesiga, F.R. et al (1999) *Sesbania sesban* improved fallows in eastern Zambia: Their inception, development and farmer enthusiasm. *Agroforestry Systems* 47: 49–66, 1999.

Kwesiga, F.R. and Coe, R. (1994) Potential of Short Rotation Sesbania Fallows in Eastern Zambia. *Forest Ecology and Management* 64, pp. 199-208.

Mudhara, M. et al (2003) Potential for adoption of *Sesbania sesban* improved fallows in Zimbabwe: A linear programming-based case study of small-scale farmers. *Agroforestry Systems* 59: 307–315, 2003.

Mafongoya P.L. and Dzowela B.H. (1999) Biomass production of tree fallows and their residual effect on maize in Zimbabwe. *Agroforestry Systems* 47: 139–151.

Mekoya, A. et al (2008) Farmers' perceptions about exotic multipurpose fodder trees and constraints to their adoption. *Agroforestry Systems* (2008) 73:141–153

Phiri, A.D., Kanyama-Phiri, G.Y., Snapp,S. (1999) Maize and sesbania production in relay cropping at three landscape positions in Malawi. *Agroforestry Systems* 47: 153–162, 1999.