

Agronomic and farmers' assessments of multipurpose forage crops in Central Honduras

Rein van der Hoek¹, Christoph Reiber¹, Michael Peters², Volker Hoffmann¹

¹University of Hohenheim, Stuttgart, Germany

²International Centre for Agricultural Research (CIAT), Cali, Colombia

Background

Multipurpose forage crops can play an important role in improving the environmental and socio-economic sustainability of smallholder production systems in fragile environments.

In the framework of a research implemented by CIAT and embedded in the BMZ/gtz supported project "Participatory selection and strategic use of multipurpose forage germplasm in Central American hillsides", around 150 poor farmers in 15 communities in the department of Yoro, central Honduras, conducted more than 200 experiments in their own fields with several grasses, leguminous crops and shrubs. A systemic approach was employed, in which the choice of methods and parameters was determined simultaneously by both farmers and researchers. The trials took place in 2002 and 2003 in three different agro-ecological zones related to altitude.

Assessments

Grasses (*Brachiaria brizantha* 26610 "Toledo", *Andropogon gayanus*, *Pennisetum spp.* "Camerún" and "King Grass") gave satisfactory results in more than 80% of the experiments.

According to the farmers, *Brachiaria* performed significantly better on good soils than on poor and regular soils.

Above 1200 m results were assessed as regular (compared to "good" at lower altitudes).



Figure 1. Farmer assessing *Brachiaria brizantha* "Toledo"

Performance of legumes (*Lablab purpureus*, *Vigna unguiculata*, *Canavalia ensiformis* and *brasiliensis*) varied. Farmers assessed the results of 55% of the trials as good or acceptable. Food security - being the primary concern - turned out to be the main criterion for the assessment of the new technologies. For instance, in the case of *Vigna* positive opinions were based on yield, use as food, feed, to enhance soil fertility and its drought resistance (all $p < 0.05$). A significant negative aspect was susceptibility to pests.

Leguminous shrubs – mainly represented by *Cratylia argentea* - showed in 75% of the cases disappointing results. However, since the plant is very much liked for its characteristics (high quality fodder, leaves covering the soil improving soil fertility and maintaining soil humidity, firewood), farmers continue experimenting with *Cratylia* in collaboration with researchers.

General conclusion

In combination with the provision of adequate information and a systematic follow-up, farmers were able to assess (new) forage based technologies properly when given the possibility to experiment freely. Valuable feedback has been provided to on-station research whereas at the same time many farmers have been motivated to become involved in the research process.

Cowpea experiments, 2003 main growing season, Yorito, Central Honduras

Table 1. Agronomic (yield) and farmers' (score) assessment of cowpea plots (*Vigna unguiculata*) (n=85)

	Yield	Score
Altitude		
<800 m	1619 ^{ab}	4.5 ^a
800-1200 m	1526 ^b	3.7 ^a
>1200 m	1006 ^a	3.9 ^a
Soil quality		
Poor	1021 ^a	3.8 ^a
Good	1747 ^b	4.3 ^a
Slope		
Plain	1276 ^a	4.4 ^a
Moderate	1363 ^a	3.5 ^a
Steep	1512 ^a	4.2 ^a
Intercropped with maize		
No	1135 ^a	3.9 ^a
Yes	1633 ^b	4.2 ^b
Urea application		
No	1122 ^a	4.5 ^a
Yes	1646 ^a	3.5 ^a
NPK application		
No	1288 ^a	4.0 ^a
Yes	1480 ^a	4.1 ^a
Insecticide application		
No	1115 ^a	3.6 ^a
Yes	1653 ^b	4.4 ^b

Table 2. Linear regression of cowpea characteristics on score (n=140)

Factor	B	Site
(Constant)	3.765	.000
Feed	.926	.150
Food	.721	.002
Drought resistance	.653	.012
Soil fertility	.403	.070
Negative plant characteristics (seed size, late maturity, etc.)	-.534	.031
Susceptibility to pests and diseases	-1.575	.000

Food security related characteristics such as food, drought resistance, but also negative factors related to seed size, late/uneven maturity and susceptibility to pests and diseases contributed significantly ($P < 0.05$) to the score assessed by farmers.

Yields in kg/ha; score: 5=very good, 4=good, 3=regular, 2=bad, 1=very bad
Figures with different superscripts differ at $P < 0.05$



Figure 3. Plots of cowpea (*Vigna unguiculata*)

Conclusion

Farmers' assessments (score) are broadly in agreement with agronomic assessments (yield) with regard to altitude, soil quality, intercropping with maize and use of insecticides. However, when slopes, urea and NPK application are considered both assessment types are conflicting. Apart from the fact that farmers criteria of good crop performance include other factors than only yield, farmers also seem to correct for certain circumstances (slopes, input use) while assessing crops and adapt their judgment accordingly.



Figure 3. Farmers assessing cowpea (*Vigna unguiculata*) during a participatory evaluation (left); seed characteristics (size, colour, even taste) are important criteria (right)