

Potential and constraints for animal feed as an objective of poor farmers in participatory research with multipurpose forage crops in Central-America

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Introduction Multipurpose forage crops can play an important role in improving the environmental and socio-economic sustainability of smallholder production systems in fragile environments. However, since the forage technology development framework has not been sufficiently applicable for poor farmers, adoption of especially legumes has been generally low (Peters *et al.*, 2001). In a participatory research effort with smallholder farmers in Honduras focused at forage based technologies, food security turned out to be the main selection criterion whereas animal feed was secondary. Since animal feed related activities (farmer-led forage seed systems, production of dry season feed) have been identified as promising income generating options for poor farmers in the hillsides of Central-America, a further analysis was carried out to identify the (mainly household related) factors inducing or inhibiting farmers to opt for production of animal feed.

Materials and methods A group of 150 farmers with different levels of resource endowment representing the typical maize and beans based agricultural system of central Honduras conducted over 200 experiments in their own fields with several grasses (e.g. *Brachiaria brizantha*), leguminous crops (mainly several varieties of *Vigna unguiculata*) and shrubs (e.g. *Cratylia argentea*). The choice of research methods and parameters was determined simultaneously by both farmers and researchers. A dichotomous logistic regression model was used to examine the variables influencing the inclusion of animal feed as an objective (Table 1). The independent variables were identified by a Principal Component Analysis.

Results Altitude had no significant influence on the inclusion of animal feed production as an objective. Full or semi landownership increased the chance of feed being an objective by 24%, controlling for other variables in the model ($p=.005$). Farmers who depend on purchased maize from outside are 17% more willing to include feed production as an objective than those who are self sufficient in maize production ($p=.025$). Every extra 100 kg/ha urea application on maize increases the chance of feed being an objective by 22% ($p=.025$). A yield increase of 100 kg/ha maize augments the chance of feed being an objective by 1% ($p=.033$). An increase of one unit of cattle increases the chance of feed being an objective by 2% ($p=.001$).

Conclusions Results indicate that farmers owning land, applying fertiliser and owning cattle are more likely to include animal feed as a research and production objective than the poorer farmers, except for those who are not self-sufficient in maize. Farmers without full decisive power over their land are reluctant to engage in animal feed production. Whereas research and development work can continue to be directed at all farmer categories in Central-American hillsides, special attention is justified for farmers without full land ownership and those who depend on outside acquired basic grains for their food security.

References

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Table 1 Definition of variables used in animal feed regression model

$\ln(\text{ObjectiveFeed}) = \beta_0 + \beta_1\text{Altitude} + \beta_2\text{LandTenure} + \beta_3\text{BuyMaize} + \beta_4\text{Ureamaize} + \beta_5\text{MaizeYield} + \beta_6\text{CattleNr} + e_i$	
Variable	Definition
ObjectiveFeed	1: yes, 0: no
Altitude	1: low (< 800 masl), 0: other (\geq 800 masl)
LandTenure	Land tenure: 1: full or semi land ownership, 0: other
BuyMaize	Maize bought for consumption: 1: yes, 2: no
Ureamaize	Level of urea application on maize (kg/ha)
MaizeYield	Maize yield (kg/ha)
CattleNr	Number of cattle