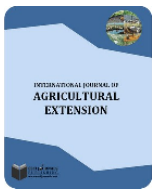

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USING AGRICULTURAL SHOWS TO CREATE DEMAND FOR DESMODIUM SEEDS IN "PUSH PULL" TECHNOLOGY ADOPTION IN WESTERN KENYA

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A B S T R A C T

Despite the effectiveness of the *Push Pull* technology in increasing maize yields by controlling Stem borer and striga weeds, farmers have yet to fully realize the benefits of this technology, which involves planting Napier grass around a maize field intercropped with Desmodium. Agricultural shows are often used to spread agricultural technologies to farmers but their effectiveness in stimulating and creating demand for Desmodium seeds, which are critical in*push pull* technology adoption had not been established or was inadequate. This study provides the missing information using a cross-sectional research design to collect data from 800 farmers at Kisumu agricultural show in Western Kenya. A valid, closed-ended questionnaire whose 0.85α reliability coefficient was above the 0.70 acceptable threshold was used. Data were analysed using Chi-square at a confidence level set a priori at 0.05α. Only 4% of the farmers practiced *push pull* technology in their farms. Most farmers (97%) who visited the *push pull* technology demonstration plot wanted to adopt it in their farms and to buy Desmodium seeds in future and 54% wanted to purchase the seeds at Kisumu Agricultural Society of Kenya Show. The study concluded that agricultural shows created demand for Desmodium seeds and that farmers were willing to buy the seeds during the shows. It is recommended that seed dealers should ensure Desmodium seeds availability and access to farmers during the agricultural shows.

Keywords: Eeffectiveness, push-pull, shows, smallholder, technology.

INTRODUCTION:

The *Push Pull* technology (PPT) developed by the International Centre of Insect Physiology and Ecology (ICIPE) offers an effective control of *Busiolla fusca* and *Striga hermonthica* and is simple, low-cost and environmentally friendly (Woodward, 2011). This technology involves planting Desmodium between two rows of maize or sorghum to improve soil fertility and stability through nitrogen fixation. Being a low-growing plant Desmodium, which improves soil fertility while providing a highly nutritious animal feed, does not interfere with the growth of maize (International Centre of Insect Physiology and Ecology, 2007). Providing farmers with farm inputs, especially seeds, is critical in raising crop productivity but the availability of certified Desmodium seeds for planting pose a big challenge that limits dissemination of the PPT (International Centre of Insect Physiology and Ecology, 2007; Kibaara, 2006; Maina & Mwangi, 2011).Companies producing Desmodium seeds need information on current and anticipated demand for strategic and tactical planning (Brennan, 2004). Insufficient market information on the actual demand for Desmodium seed makes it relatively unattractive for seed companies to invest and produce certified seed. Farmers practicing PPT are forced to use vegetative propagation method or to buy uncertified seeds among themselves (Odame *et al.,* 2008).The objective of the study was to determine the effectiveness of Kisumu agricultural show in stimulating demand for Desmodium seed among smallholder farmers in Western Kenya. The researchers hypothesized that possession of this missing information would enable extension providers, ICIPE, community-based organizations and other development partners to effectively disseminate information on Desmodium seed for purposes of

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increasing the adoption of the PPT among smallholder farmers in Western Kenya.

MATERIALS AND METHODS

The study used a cross-sectional survey design to collect and analyze data. The design enabled faster collection of information, allowed for hypotheses testing and was inexpensive (Kendall, 2007, Kombo & Tromp, 2008, Kothari, 2008). Chances for attrition were also minimized. The study location was the 2008 Kisumu agricultural show organized in Western Kenya. This show is normally held towards the end of the month of July and the beginning of August. Kisumu is situated in western Kenya and borders Uganda to the west, Tanzania to the south and lies between latitude 1° 8' N and 1° 24' S and between longitude 34° and 35° E (Jaetzold & Schmidt, 1982, 1983). The population of study comprised of farmers that visited the Ministry of Agriculture PPT demonstration plot at the Kisumu showground in 2008. The target population consisted of farmers attending the PPT demonstration plot at Kisumu agricultural show in 2008. About 800 individuals that randomly visited the Ministry of Agriculture PPT demonstration plot at the Kisumu agricultural show were interviewed. Since the schedules for agricultural shows were already fixed by Agricultural Society of Kenya (ASK), Kisumu agricultural show was selected conveniently. A closed-ended questionnaire validated by a panel of extension experts, whose 0.85α reliability was above the 0.70 acceptable for educational research was used. Pre-testing of the questionnaire to the show-goers/respondents was done at Kisumu ASK pre-show days using 55 show-goers. Data were analysed using Chi-square at 0.05α set a priori.

RESULTS AND DISCUSSION

In this study, 97% of the farmers who visited the PPT demonstration plot wanted to plant PPT in their farm while 54% of them wanted to purchase Desmodium seeds at the Kisumu ASK show (Figure 1). More than 94% of these farmer respondents indicated their intention to buy Desmodium seeds in the near future. Over 67% of the farmers who bought Desmodium seeds preferred those packed in 500 grams or less. The farmer's gender influenced the quantities of Desmodium seed purchased (χ^2=11.33, df=4, p-value=0.02).

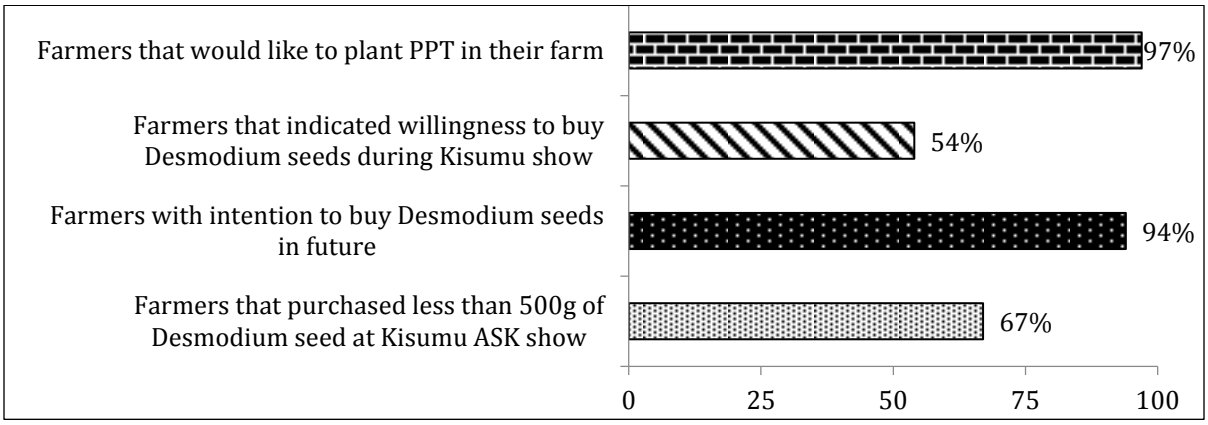

Figure 1.Farmers' intention to buy Desmodium seeds.

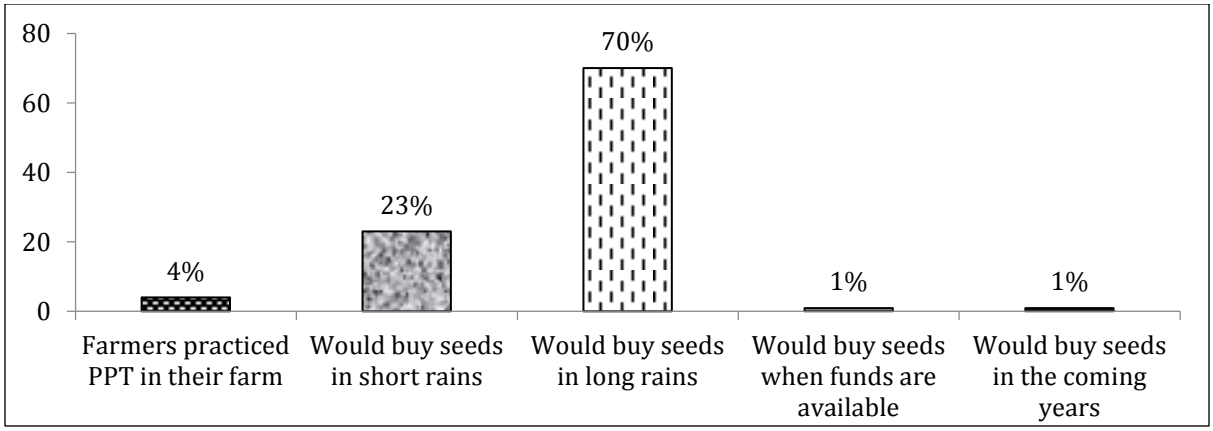

Figure 2. Farmers' intention to buy Desmodium seeds.

Figure 2 indicates that only 4% of the farmers practiced PPT in their farms. About 70% of the farmer respondents said that they would buy Desmodium seeds during the long rains, 23% during short rains of 2008, 1% when they get money and 1% in the coming years.

The intention of the farmer respondents to buy Desmodium seeds in the near future was statistically significant (Table 1). About 75% of farmers with non-formal education intended to buy Desmodium seeds in the near future, compared to 92.3% with primary level of education 95.4% with secondary education, 96.5% with college education and 93.1% with university education. Of the 246 farmer respondents within age category 16-30 years, 94.7% indicated their intention to buy Desmodium seeds in the near future. The age category of 31-45 years that comprised 306 farmers showed that 95.1% of them intended to buy Desmodium seeds in the near future. About 70.3% of these farmers intended to buy Desmodium seeds during the long rains. The farmers indicated their intention to purchase all ranges of quantities of Desmodium seeds from less than 500 grams to above 2000 grams.

Table 1. Preferences for Adopting PPT by Farmers (N=800)

Farmer's Characteristics	Intention to buy Desmodium seeds in the near future (%)	Chi-square	P-value
Non- formal level of education	75.0	17.02	0.00
Primary level of education	92.3		
Secondary level of education	95.4		
College level of education	96.5		
University level of education	93.2		
Age category of 16-30 years	94.7		
Age category of 31-45 years	95.1	3.09	0.54
Age category of 46-60 years	93.1		
Age category above 61 years	100.0		
Buy in Desmodium seed short rains	99.5	742.52	0.00
Buy Desmodium seed in long rains	100.0	743.17	0.00
Buy Desmodium seed when funds are available	100.0	742.51	0.00

The effectiveness of agricultural shows in enhancing demand for Desmodium seeds was related to the smallholder farmers' education level, their intention and the period they indicated to buy Desmodium seeds in the future. However it was not affected by the age of farmers or quantities of Desmodium seed bought by smallholder farmersparticipating in agricultural shows. The intentions to buy Desmodium seeds in the near future by farmer respondents under the study was statistically significant to the level of education and time the farmer intended to buy Desmodium seed but not related to the age and quantities of Desmodium seed bought at the show.

DISCUSSION

Many farmers visiting Kisumu ASK agricultural show had their farms infested with striga and stem-borer pests and wanted Desmodium seeds to establish PPT plots. The findings indicated that farmers were willing to buy Desmodium seeds during the agricultural shows. Many farmers bought Desmodium seeds that were packaged in 500 grams or less. The farmer's gender influenced the quantities of Desmodium seed purchased ($p<0.05$). Very few farmers practiced PPT in their farms despite the problem of striga and stem-borer but many of them showed willingness to buy Desmodium seeds. The farmers' level of education unlike age and quantities of Desmodium seeds sold influenced their intentions to buy Desmodium seeds in the near future.The farmers indicated their intention to purchase all ranges of quantities of Desmodium seeds but preferably those weighing 500 grams or less. Farmers' education level, their intention and the period they indicated to buy Desmodium seeds in the future was related to the agricultural shows effectiveness to stimulate demand for Desmodium seeds.The farmers' intentions to buy Desmodium seeds in the near future was related to their level of education and planting season but not related to farmers' age or the amount of Desmodium seed bought at the show. The findings of this research concur with Wider Impact Strategy (2008) that the optimal size for seed packets varies with the intended buyers. Farmers who are not familiar with a new variety are likely to buy

small quantity of seed for trial purposes and because it will be cheaper. It is also a risk management strategy. The risk involved if the variety does not perform well in their cropping situation in a particular season is small. A farmer who has had previous good experience with a particular variety is ready to invest more in producing it and is likely to buy a larger package.

CONCLUSION

From the findings, it was concluded that agricultural shows created demand for Desmodium seeds and farmers were willing to buy Desmodium seeds during the agricultural shows. Promotion and marketing of Desmodium seeds in the agricultural shows is key to adoption of the PPT. Desmodium seed should be availed in packages of 500 grams or less in all the shows. Information on Desmodium seeds should be packaged targeting farmers with various education levels.The agricultural shows provided linkages between farmers, seed dealers, extensionists, and researchers that was important for accessing knowledge, skills, professional advisory services, financial support services, credit facilities and networks on Desmodium seed and enhancing adoption of PPT.

RECOMMENDATION

The researchers recommended that stakeholders should ensure availability and farmers' access to Desmodium seeds during the agricultural shows and exhibitions.

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