NON-TRADITIONAL APPROACH TO SMALL SCALE FARMERS MANAGEMENT PRACTICES

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Abstract

The farm management practices of small cotton farm holders in the Philippines and its low productivity are discussed, and a production model to overcome the limitations of these traditional practices and farm management is proposed.

1.0 Introduction

A reservoir of cotton technologies and practices are available to suit the varying growing conditions and needs of the growers, from a low input manually- operated farm practices common in Africa and South East Asia to an intensive highly mechanized farm practices found in the United States, Australia, Mexico, Central America and Middle East.

This variation in production practices reflects the grower effort to fit his crop to the climate and soil conditions in the locality, and the available labor and farm resources.

This paper attempts to describe the farm management practices typical of the small cotton farm holders, and propose a production scheme that would address its limitations and raise cotton productivity, make it sustainable, efficient and competitive.

2.0 Small Farm Holder Cotton Production System

In the Philippines cotton is grown by resource-poor farmers in small farm lots, following low farm management and limited use of farm inputs.

Several programs were designed by the government to develop the local cotton industry. But despite the three decades of commercial cotton plantings, the cotton industry remained marginalized with farmers' participation unsteady, and productivity low and erratic.

The soil and climatic parameters are not constraints to high productivity as shown by the high seedcotton yield potential of up to 6.5 tons/hectare when cotton is grown under high input, intensive management and close farm supervision (Cosico et al 1997, 1998). This is vouched by the 2 –3 tons/ha seedcotton yields obtained in commercial fields by progressive farmers who comply with technical recommendations.

The cotton production landscape in the Philippines is characterized by small fragmented farm lots, sparsely dispersed, tilled by numerous farmers of varied cultures, training and farm experience. Wide farm-to-farm variation exists due to diverse growing conditions and practices.

Cotton is grown in mixed culture with other crops in staggered planting giving rise to a highly diversified ecosystem. The mix cropping is practiced to minimize the risk caused by abnormal weather conditions and fluctuating farm prices, and to optimize labor productivity in the farm.

On the other front, cotton growing technology is tailored for small farmers with low input and manual farm operation. The technology is well-tried and considered appropriate given the existing resources and growing environment of poor-resource farmers (Agridev, 1999) The productivity, however, is low averaging about 1 ton seedcotton yield per hectare. The low level of farm inputs and management could not support higher yields, and the small farms size prevent the adoption of technological advances and efficient mechanized farm operations (Agriswiss, 1999).

Extension services are provided by local government agricultural technicians who supervise multiple crops grown by farmers. Cotton is relegated at the back seat, giving food crops like rice and corn top priority. Quality extension services suffer due to unfocused and loose technology transfer prone to short cuts/deviations by farmers.

Access of farmers to credit from government financing institutions and private development company is limited. With low farm inputs and often times untimely availability and/or application, productivity is affected.

Lastly, farm management through individual small farmers is loose, highly variable, costly and inefficient.

These inherent limitations of the small land holding production system results to low, erratic yield and high production costs which is not sustainable (Agriswiss, 2000).

3.0. Towards Developing A Non Traditional Approach To Small Scale Farm Management

The high productivity of cotton in growing regions with large farm size and where agriculture is intensive and mechanized, is related to efficient farm management and application of modern technological advances.

It is difficult to succeed in an agriculture managed by large number of small farmers with limited resources. Technological know how could not efficiently and economically be transferred to farmers, or that the farmer have no resources to adopt these technologies and farm practices. (Agridev, 1999)

Requisites to farm mechanization and application of modern technologies in the traditional small land holding agriculture is the consolidation of small farm lots, organization of farmer groups, rationalization of cotton growing technologies and the professional and centralized farm management mediated by the private development company.

2.1 Farm Clustering

In the context of Philippine setting, corporate farm management is not feasible due to agrarian law that limit large land ownership and other restrictions. The compromise alternative is to consolidate small farm lots of farmers to form clusters of economic size in order to achieve economies of scale in farm operations thus effecting efficient farm management and mechanization of farm operation. A definite cropping pattern where cotton fit in should be institutionalized to optimize the use of farm labor, machineries and equipment.

2.2 Formation of Farmer Cooperatives/Groups

Coupled with farm clustering is the formation/organization of farmer cooperatives and groups. Centralize and efficient implementation of farm activities is made possible with organized farmer groups. Arrangements for example, of seeds and farm inputs in volume purchases give due advantage compared to individual farmer's purchases. Groups will also allow affordability in owning costly implements for mechanized farming and farm infra structures.

2.3 Cotton Growing Technologies and Practices Rationalization

Cotton growing technologies and practices should be modified to suit large farm setting that will allow application of modern farm practices and efficient farm management. Specifically the following practices merits consideration:

2.2.1 Weed control- The traditional approach of weeding performed by hand pulling and manual cultivation should be modified to accommodate the integration of herbicide. Manual weeding is not only arduous but labor intensive requiring numerous man-days to do the weeding. It takes time to complete the operation and could not be performed efficiently during inclement weather. Usually performed late, significant crop-weed competition has already occurred, reducing the yields (CRDI 1980).

Pre-emergence application of diuron followed by early- post emergence application of fluzifop butyl against grass weeds and/or directed spray of glyphosate proved effective and economical in controlling weeds (CRDI 1980).

2.2.2 Mono Cropping - To simplify field operation mono cropping shall be adopted following a defined crop rotation, normally rice-cotton in the lowland paddy and corn-cotton in the upland. Mechanized planting, cultivation, spraying, and fertilization could be carried out efficiently in mono crop field.

The preceding rice and corn crops are shallow- rooted, followed by cotton with tap root system, will result to an efficient nutrient foraging ability of the cotton roots for the inherent and residual nutrients applied to rice and corn. Of course the issue of diverse habitat in mix cropping in relation to enhancing biological control is there (Fitt, 1989), but in large farms especially for a generalist pest like Helicoverpa spp there is little evidence that reduce diversity per se leads to pest outbreaks (Hearn and Fit 1992). In fact monoculture may dislocate pests' life cycle by removing alternate host and diluting the attack over an abundant crop (Fitt, 2000)

2.2.3 Higher Rates of Fertilization – the low rates of fertilization is unable to support high yield but is justified under the traditional system because yield could not be maximized due to generally low inputs and management. However, with improved insect control, irrigation and weed control, higher fertilization is needed to support high productivity.

2.2.4 Coordinated and Centralize Irrigation – A centralize irrigation source will supply the water requirements of a group of farmers or production cluster efficiently in coordinated manner instead of each small farm having its own.

2.2.5 Insect Control – Integrated pest management undoubtedly is effective and cost- efficient. This include identification and constant monitoring of pest infestation through scouting, use of thresh hold level, proper time and dose of application combined with cultural and biological control measures. The IPM should be built on cotton with inherent resistance to common pest as in hairy varieties against leafhoppers and transgenic Bt cotton against Helicoverpa and other lepidopterans.

2.4 Farm Mechanization

With economic farm size achieved through area consolidation, farm operations could now be mechanized such as in plowing, harrowing, furrowing, planting, and fertilizer application which bring advantage in term of fast and precise input application. Precise row and hill spacing and seed placement will ensure the desired plant density, uniform seedling emergence and plant stand. Moreover, the utilization by the plant of the applied inputs such as fertilizers and pesticides will be more efficient when mechanically applied.

2.5 Anchor Firm -Based Farm Management

Cotton cultivation is exacting and demand constant vigilance against variety of pests and diseases. The complementary partnership of the farmer cooperatives and the development company is necessary in addressing and providing the professional farm management, timely provision of inputs, technical advise , supervision and assured market.

3.0 The Pilot Farm

The above production technology package and farm management is currently pilot-tested to validate its technical, economic and operational feasibility. A contiguous area of 20 hectares owned by individual small farmers were consolidated. The enhanced package of cotton growing technology make use of mechanized land preparation, planting using delinted seeds, moderate to high level of fertilization, herbicide-based weed control, centralized irrigation, and integrated pest management anchored on jassid resistant cotton variety, use of threshold level, screened and tested pesticides and coordinated pesticide sprays. The farm land owner supply the farm labor and implement the prescribed practices in coordinated manner. Agriswiss technician provides the overall farm management and supervision.

4.0 **Conclusion**

The prerequisite to farm mechanization and application of advanced technology in small farm size production system is the consolidation of small farm holdings into economic size and the organization of farmers into functional groups.

The declining land area devoted to agriculture due to massive conversion into industrial and commercial uses, crop competition and increasing cotton demand call for maximizing to the fullest productivity per unit area coupled with cost-efficient cotton production. We believe this could be achieved through the application of modern technology and farm mechanization.

The approach being proposed will address the low productivity of small farm holding agriculture and will make cotton growing more productive and competitive. The problem, however of area consolidation and farm infrastructure needs should be overcome. The task is formidable owing to social, cultural and economic differences and needs of farmers.

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