Supplementary figure to the article "Fuzzy multicriteria analysis of "Better Cotton" farmers' adoption and experts' recommendation on cotton pest and disease management practices", by Absar M. Jiskani, Manzoor A. Abro, M. Ibrahim Khaskheli and Khadim H. Wagan.

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Figure S1. Cotton pest and disease management practices

Resistant cultivar

Pest-resistant and pest-tolerant cultivars developed through traditional breeding or genetic engineering are used in this strategy. These cultivars have physical, morphological, or biochemical characteristics that make the plant less attractive to pests or make it more difficult for them to feed, develop, or reproduce. These cultivars are resistant to or tolerate pest damage, leading to lower yield losses. In CPDM, this is the first line of defense.

Although increasing the use of variety resistance is one of the preferred methods to reduce pesticide use, it will lead to more risk exposure to the risk of resistance being avoided. Variety resistance is very important for cotton crops, especially for Cotton leaf curl disease, bacterial blight, boll rot, root rot and verticillium wilt disease.

Crop rotation

The goal of crop rotation is to reduce the number of pests in the soil. Plant with other field or vegetable crops as needed to maintain soil productivity and reduce the occurrence of various cotton pests, such as nematodes, Verticillium wilt, seedling diseases, pink bollworm and other diseases. Different rotation crops bring different benefits to the soil, so they also bring different benefits to the subsequent cotton production season.

Seed treatment

Seed treatment can protect seeds and seedlings from medium and low degree attacks of insects in the process of emergence and establishment. They work by forming a chemical barrier on the surface of germinating seeds to protect them from insects.

Bt with non-Bt Cotton

Over the years, Bt cotton's resistance to pink bollworm has reduced, bollworm can develop resistance to the toxins in Bt crops, while planting non-Bt crops nearby can help to slow down the pressure of evolutionary selection, resulting in resistance of pest populations.

Border crop

Border/trap crops refer to crops grown together with major cotton crops, which are attracted to feed, reproduce and survive in order to protect them from specific pests or several pests. These crops are usually planted along with the main cotton crops as intercropping, border, or strip sowing.

NEFR technology

Natural Enemies Field Reservoir (NEFR) technology is an approach that provides a safe habitat to the already existing natural enemies of the target pest by manipulating the existing environment on the farmer's field. Integration of NEFR innovation has been successfully tested in the management of mealy bugs, fruit flies and a number of other agricultural pests. It is used as a biological control for cotton mealybug through *Aenasius bambawalei* – a biocontrol agent.

Yellow sticky cards

The yellow sticky card is used to control cotton sucking pests. The yellow color attracts whiteflies, moths, aphids and flea beetles. Once flies sit on the yellow sticky card or sticky card box, they will stick to it and cannot fly because of the sticky card. It prevented or controlled the significant increase of whitefly population and blocked the opportunity of population outbreak.

Pheromone traps

Pheromone traps are useful tools for monitoring pink bollworm which is an important pest of cotton. It is a non-toxic trap and an effective method to control pink bollworm.

Botanical spray

Spraying plant extracts or plant mixtures of different plants such as *Azadirachta indica*, *Aloe barbadensis*, *Andrographis paniculate*, *Ocimum* spp., *Capsicum annum/C. frutescens*, *Coriandrum sativum* on cotton crops is very important to control cotton pests because it helps attract predators to eliminate pests on cotton crops.

Chemical control

In chemical control, pesticides are used to achieve the desired result. Pesticides in IPM are used judiciously and only in conjunction with other methods when necessary. Using pesticides in a way that minimizes harm to humans, non-target organisms, and the environment should be a priority.