



74th Plenary Meeting of the INTERNATIONAL COTTON ADVISORY COMMITTEE

REPORT

Committee on Cotton Production Research of the ICAC

SIXTH OPEN SESSION – TECHNICAL SEMINAR

Elimination of Insecticides from Cotton Production: Is this Possible?

8:30 hr. Wednesday, December 9, 2015

Mr. Samir Kishore Shah, Bhaidas Cursondas & Co., India in the Chair

Dr. Francesca Mancini, Food and Agriculture Organization of the United Nations, “Reducing insecticide risk in cotton”

Dr. Greg Constable, Commonwealth Scientific and Industrial Research Organisation, Australia, “Cotton breeding and physiology research in Australia”

Dr. Keshav Kranthi, Central Institute for Cotton Research, India “Is cotton possible without insecticides?”

Dr. Srinath Bala, Bayer CropScience, India, “Cotton: key trends and insect pest management”.

Dr. Francesca Mancini of the FAO stated that the compound annual growth rate in market pesticide sales for the seven years since 2007 is from 5% to 8% per annum, which is mostly due to increases in herbicide referred to herbicide tolerant biotech crops. Insecticide use on cotton in general has gone down significantly from the peak values of the nineties, although increases related to outbreaks of secondary pests have been recently registered in some countries. The strategic components of a pesticide risk reduction approach are to reduce overall use of agrochemicals, select less highly hazardous pesticide products and, lastly, ensure proper use by adopting life cycle management and behavior change practices for farmers. These three steps are consequential, addressing proper use alone has proven to be challenging and counterproductive. Efforts should be made to eliminate the use of Highly Hazardous Pesticides (HHPs). HHPs are clearly defined by eight criteria established by the WHO/FAO Meeting on Pesticide Management and are those ingredients and formulations that can cause severe or irreversible adverse effects on human health and the environment. In the short term, the elimination of HHPs from cotton production would contribute enormously to reduce environmental and social negative impacts. The major success factors for reduction in use of insecticides are: an agro ecological approach to pest management; an area-wide IPM management to maximize efficiency; greater availability of alternative pest controls; enhancing farmers’ knowledge and skills to manage crops; and supportive policies. Dr. Mancini concluded that much progress has already been made toward reduction of insecticide use and promotion of good agricultural practices. However, there are threats to this achievement, for instance the recent re-introduction of subsidies for pesticides in some cotton producing countries risks to lead to overuse of agrochemicals again.

Dr. Greg Constable, ICAC Researcher of the Year 2015, presented his thoughts focused on the role of breeding and physiology for improving yields and quality. The Australian experience has shown that cotton has a theoretical potential to produce 5,034 kg lint/ha. Based on the increases in yields in Australia, breeding alone contributed to almost half of the improvement in yields. Breeding is limited by genetic diversity, while management practices may not be duplicable under different production conditions. While the role of biotechnology approaches will continue to increase, breeding will not lose its significance. Breeding must target multidisciplinary coordinated efforts in order to bring efficient improvements. On the fiber quality aspect, Dr. Constable emphasized the need to improve fiber strength,

which must be rewarded in price. Molecular marker breeding is complicated due to the complex nature of inheritance of most valuable characteristics in cotton. It will, however, ultimately be adopted. On the physiology side, genetic engineering of photosynthesis must be used as a molecular tool for yield improvement. Biochemical resistance and special characters as a natural source of insect control were discussed, although Dr. Constable stated that special characters like high gossypol, frego bract, etc. are capable of controlling low insect pressures. Less leaf hairiness is preferred in Australia to avoid contamination of seedcotton. Dr. Constable also stated that he has not observed any relationship between nutrient uptake and pest attack, although vegetative plant foliage encourages insect survival. There is no straightforward answer to the question of why fiber strength has not been shown comparable improvements to those observed in fiber length, fineness and other fiber quality parameters.

Dr. Keshav Kranthi started his presentation entitled 'Is cotton possible without insecticides?' with a resounding 'yes'. He stated that insect problems are man-made and that nature controls insects. Insecticides have contributed to the spread of insects rather than to their control. So-called man-made 'interesting' solutions include: plants that scare aphids; plants that invite natural enemies; plants that starve insects; gene silencing that starves bollworms; male-sterile insects; and fungus inside plants kills insects. Each sector has many options. However, conserving ecosystems holds the key to the Integrated Pest Management (IPM), on which he focused by presenting examples for various pests in India. Relevant management techniques include: use of short duration varieties; early sowing; judicious employment of fertilizers; insecticide intelligence; conservation of natural controls; intercropping for IPM; and intelligent use of IPM tools.

The presentation of Dr. Srinath Bala focused on the advancement of technology of cotton in India with emphasis on historical perspective, while informing that usage of crop protection chemicals in India is rising after 13 years of insect resistant biotech cotton. The pressure from sucking insects is increasing, which is probably due to the fact that the donor variety for biotech gene was susceptible to whitefly, jassids and thrips. Bollworms are returning to biotech cotton due to resistance. At the same time, minor pests, such as like mirids and mealy bugs, which damage squares and flowers, have been able to survive and multiply on cotton mostly because of the reduction in use of insecticides. Mr. Bala advocated safer and judicious use of insecticides. He stated that the pesticide industry is always looking for ways to be more sustainable and that the pesticide industry is not evil. He agreed that integrated approach is the best way to manage pests & enhance productivity.

In response to a question, Mr. Bala replied that he does not think that insecticide can be eliminated in the next 8 to 10 years. In reaction to this statement, the ICAC Secretariat commented that insecticides can certainly be eliminated if the correct choices are made and that ICAC is working to correct the impression that cotton cannot be grown successfully without insecticides.

The Sixth World Cotton Research Conference (WCRC-6) will take place in Goiania-GO, Brazil during the period of May 2 to 6, 2016. For the first time, it will be organized under the auspices of the International Cotton Research Association (ICRA) and will happen jointly with biannual meeting of the International Cotton Genome Initiative. The Cotton Growers Association of the State of Goiás (Agopa), under the scientific coordination of the Brazilian Agricultural Research Corporation (Embrapa) and the support of the Brazilian Cotton Growers Association (Abrapa) and the Brazilian Cotton Institute (IBA) will host the Conference. Brazilian cotton research is coordinated by Embrapa Cotton and employs over 100 researchers from the federal and state governments, universities and the private sector. Some 400 participants from around the world are expected to participate. There will be two keynote speakers, eight plenary speakers and nine concurrent sessions covering all disciplines related to cotton production. Online registration is available at www.wcrc-6.com.