



## 2, 4-D Phytotoxicity in cotton - Management

-K. Sankaranarayanan and D. Kanjana

In cotton, 2,4-D phytotoxicity incidence is getting increased in Tamil Nadu; even though, farmers and agro input dealer are aware of high sensitivity of cotton to 2,4-D. Field level enquiry found that drift from nearby maize field caused the toxicity. Maize is competitive crop for cotton in both under rainfed and irrigated condition in Tamil Nadu. Cotton and maize fields are coexisting in many areas. The commonly followed weedicides for maize is atrazine, which is not effective in controlling *Portulaca quadrifida* and needs post emergence /mixing of 2, 4-D for successful control. The spray drift from adjacent cotton field caused phytotoxicity. The drift could be possible, i) direct spray drift by high wind velocity, ii) through irrigation water passed from 2,4-D sprayed field with spillover in soil, iii) using of sprayer used for 2,4-D spraying, iv) owing to the volatile nature of 2, 4 – D , its vapors caused injury to the nearby cotton.



Washing of 2, 4-D used sprayer by water 3-4 times cannot make free from residue of 2,4-D and subsequent use in cotton caused phytotoxicity. The following techniques are precautions are recommended are 1) Avoiding of 2, 4 – D use in maize, if cotton is grown in the adjoining fields. 2) After spraying 2, 4 – D, filling of spraying equipment as well as tubs, buckets, etc. with 0.5 percent washing soda solution (500 g of washing soda in 100 litres of water) in the evening and flush out all equipment thoroughly with fresh water in next day. 3) Separate sprayer for 2,4-D. 4)Clipping of epinasty followed by foliar spray of ZnSO<sub>4</sub> (0.5% +0.25% CaO) was found to be effective reported from other studies.

### Meetings attended

- Dr. V. N. Waghmare, Director (Acting), ICAR-CICR, Nagpur attended the second meeting of the Field Inspection & Scientific Evaluation Committee (FISEC) regarding spread of unapproved Herbicide Tolerant (HT) cotton in the country on 15.11.2017 at New Delhi.
- Dr. V. N. Waghmare, Director (Acting), ICAR-CICR, Nagpur attended meeting of Special Investigation Team (SIT) held under the chairmanship of Office of Divisional Commissioner (Revenue), Amravati Division at Amravati on 21.11.2017 in connection with death of farmers / farm labourers due to insecticide poisoning.
- Dr. S.M. Wasnik, Principal Scientist, Extension attended Rural Advisory Programme Committee Meeting of All India Radio on 24th Nov 2017 at Akashwani, AIR, Nagpur. Lists of scientists and topics for broadcasting during the next quarter period January- March 2018 was supplied to programme organizer for including scientists & topics.

*Times of India 18.11.17*  
**Experts blame wrong practices for pest attack**

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**Nagpur:** This year, a major attack of pink bollworm, the biggest killer of the cotton crop, has been seen in vast tracts. A ground level survey carried out by the agriculture department here shows that bollworm may be present inasmuch as 2 lakh hectares of farmland under cotton in Yavatmal.

The bollworm resistant Bt gene is made by US MNC Mon-

santo which has provided the technology to seed manufacturers on a franchisee basis.

Experts also blame the pest attack to wrong farm practices. The growers are supposed to grow some non-Bt crops within the rows of Bt cotton. This diverts the bollworm to non-Bt crop. They are also advised to end the crop by December so that it breaks the pests' life cycle.

Farmers say they have to pull on for a longer duration

so that the output increases. Ending the crop earlier would leave them with less harvests.

Sources in the agriculture department said a survey was carried out after complaints were received from farmers in Yavatmal.

The department has asked farmers to continue spraying pesticide which, however, is not available. Apprehensive of government action, dealers have stopped selling the chemicals. Even farm hands are re-

luctant to take up spraying jobs, say locals.

CICR director VN Waghmare said nearly 50% of bolls are estimated to be under pink bollworm attack. "In places like Yavatmal it could be even 70%. This is mainly due to the practices adopted by the farmers. Two rounds of pickings have already been completed, which means that some part of the crop has been saved," he said.

Waghmare said the crop

has to be terminated by December. "This will ensure the pest's life cycle is broken. Non-Bt crops have to be sowed in between. But, farmers having irrigation facility try to extend the crop beyond December and also avoid growing the non-Bt plants," he said.

"There was a similar crisis in Gujarat till last year. The pest has been brought to minimal levels due to joint efforts of farmers and government," said Waghmare.

**'Bt technology is very good. It all depends on how we use it'**

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**T**he Central Institute for Cotton Research (CICR) is the country's only dedicated institute engaged in research in cotton. Cotton has been the primary crop of Central India but in recent years it has become a problematic crop with increasing attack of pests despite farmers growing bollworm resistant cotton (Bt cotton) in almost 95% of the area. TOI spoke to CICR director VN Waghmare on these issues and the suitability of the crop in the region.

Excerpts from an interview...

**Q. Cotton has been a traditional crop for decades in Central India. But now its suitability to the region is being debated. What are your views?**

**A.** Cotton was being grown across India including central part even before the Britishers came to India. However, we were growing desi cotton varieties till partition. It was only after partition that American cotton (hirsutum) was introduced in the country due to its big boll size and better quality fibre. Gradually, almost 97% of cotton-growing area went under it and desi was restricted to just 3% area. But, with the arrival of heliothis insect on the hirsutum, researchers developed a boll worm and heliothis-resistant variety, the Bt cotton by American giant Monsanto. Though Bt cotton has developed resistance to pink bollworm the suitability of cotton for the region cannot be questioned to such an extent. If we discard Bt completely, helio-

this menace will come back again.

**Q. There are questions being raised about the suitability of the local soil for cotton cultivation.**

**A.** I am not a soil scientist myself but know that cotton has been a preferred crop of farmers here. As far as question of soil is concerned, it is not uniform or is heterogeneous which means its quality differs even within a patch of 2-3 acres. For soil health cards, the government has asked to have different cards for patches of 10 hectares in dry land area and 2.5 acre in irrigated area. One cannot generalize the soil suitability and quality for such a huge area. Otherwise also Bt cotton which occupies almost 98% of the area is an nutrient-exhaustive crop. It depletes the soil and hence some leguminous crops need to be alternated with cotton to get the desired output.



**COTTON EXPERT VIEW**

**Q. Is it time that we rethink on switching to other crops in the region as over the years the weather pattern has changed and so has the pest types?**

**A.** There cannot be a yes and no answer.

Central India has been known for its black cotton soil. Farmers are the best judges actually. Climate change has been there but it applies to all other crops too equally. Hence, there is a need to develop climate-resilient crops. At present, there seems no alternative to Bt cotton as if it is removed there will be havoc of heliothis again like in the 1990s. Bt technology is a very good technology in itself. It all depends on how we use it. If we follow the required or recommended cultivation practices cotton can remain to be a good crop for the region. At CICR, we cultivate Bt and non Bt together but there is no boll worm attack due to use of right practices. In fact the Bt cotton area this year increased from 37 lakh hectares to 42 lakh hectares this year.



*Times of India 2.11.17*  
**CICR report warns against in-tank chemical mixing**

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**Nagpur:** The ICAR-Central Institute for Cotton Research (CICR) in its report on deaths of farmers and farm workers due to pesticides exposure has categorically stated the institute did not recommend any cocktail or tank mixing of insecticides, weedicides and plant growth regulators. In fact, it has suggested the use of less hazardous pesticides for pest management, diseases and weeds considering adverse effect on human, livestock and environment.

CICR has submitted the report to Indian Council of Agricultural Research (ICAR) and was likely to submit it to the SIT probing the case on Wednesday.

The Central Insecticide Board and Registration Committee (CIBRC) has approved only 88 insecticides for stand alone use and 17 in ready-mix combinations, four fungicides for stand-alone use and two in combinations. The report specifically mentions a mixture of Flpronil 40% with Imidacloprid 40% (Police) is not re-

**CONTENTS OF THE REPORT**

FINDINGS	SUGGESTIONS
<ul style="list-style-type: none"> <li>&gt; Farmers used non-recommended tank mixtures of pesticides and fertilizers</li> <li>&gt; Used concentrations higher than recommended</li> <li>&gt; Farmers/farm labours were confident with their previous years experience and didn't adequately protect the body</li> <li>&gt; Prolonged and frequent direct exposure led to intoxication</li> <li>&gt; High temper-</li> </ul>	<ul style="list-style-type: none"> <li>atures along with humidity induced profuse sweating that led to absorption of insecticides</li> <li>&gt; In Yavatmal district, plant height was more and so user had to direct the sprays upward. This increased the inhalation chance</li> <li>&gt; No measures like protection kits were used</li> <li>&gt; Workers were working on contract basis and hence sprayed much more per day</li> <li>&gt; Workers neither bathe, nor change. They also prepare tobacco for chewing</li> </ul>
	<ul style="list-style-type: none"> <li>&gt; Mass awareness required about Dos and Don'ts by authorities</li> <li>&gt; Should cultivate sucking pest tolerant cultivars advised for the region</li> <li>&gt; Farmers should be advised on selection of cultivars, quantity of fertilizers, insecticides and growth regulators to be used</li> <li>&gt; Dissemination of information to farmers and workers using different media</li> <li>&gt; Use of less hazardous chemicals</li> </ul>

commended on cotton at all. It says that use of monocrotophos, though banned on vegetables, was allowed on cotton. But it is a Class I (b) or highly hazardous chemical as per WHO guidelines.

With cultivation of illegal

HTRR Flex cotton, some farmers sprayed glyphosate (weedicide) just a few days after sowing and subsequently for insect pest control. Some farmers even sprayed ten times.

> Continued on P 5



अकोला : मूर्तिजापूर तालुक्यातील सिरसो शिवारात कापूस पिकाची पाहणी करताना सीआयसीआरचे अधिकारी व कृषी विभागाचे अधिकारी.

## सीआयसीआरच्या प्रतिनिधींकडून बॉड अळी प्रादुर्भावाची पाहणी

अकोला (प्रतिनिधी) : देशभर गाजत असलेल्या बॉड अळी प्रादुर्भाव प्रकरणाची दखल घेत बुधवारी (ता. २९) केंद्रीय कापूस संशोधन संस्थेच्या (सीआयसीआर) प्रतिनिधींनी जिल्ह्यात विविध भागांत भेटी देऊन कपाशी पिकाची पाहणी केली. मूर्तिजापूर तालुक्यातील सिरसो, तसेच कौलखेड जहांगीर शिवारातील कपाशीच्या पिकाची पाहणी करून बॉड अळीबाबत शेतकरी व तज्ज्ञांकडून माहिती घेतली.

जिल्ह्यात बॉडअळीमुळे हजारो हेक्टरवरील कापूस पिकाचे नुकसान झाले आहे. विशेषतः प्री-मॉन्सून लागवड झालेल्या कपाशीवर बॉड अळीने जोरदार हल्ला चढवला असल्याने उत्पादकता मोठ्या प्रमाणात घसरली. ठिकठिकाण शेतकऱ्यांनी कृषी विभागाकडे तक्रारीही केल्या. पिकाची

पाहणी करून तातडाने मदत मिळावी, या मागणीची निवेदने मोठ्या प्रमाणावर दिली जात आहेत. अशा परिस्थितीत सीआयसीआरच्या पथकाने बुधवारी जिल्ह्यातील कापूस पट्ट्यात भेट देऊन माहिती घेतली. यामध्ये सीआयसीआरचे प्रतिनिधी डॉ. फंड, डॉ. चिन्नाबाबू नाईक यांचा समावेश होता. त्यांच्यासोबत जिल्हा अधीक्षक कृषी अधिकारी राजेंद्र निकम यांच्यासह अधिकारी उपस्थित होते. सकाळी हे पथक मूर्तिजापूर तालुक्यातील सिरसो गावात गेले. तेथे शेतामध्ये जाऊन पिकांची पाहणी केली. बॉड अळीबाबत वस्तुस्थिती जाणून घेतली. दुपारी ही समिती कौलखेड जहांगीर येथे पोचली. तेथील शिवारात जाऊन माहिती घेतले. ही समिती आपला अहवाल त्यांच्या बांधांना देणार आहे.

## Pesticide, not in recommended list, a hit among farmers

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**Nagpur:** Monocrotophos, one of the pesticides used by majority of the victims, was removed from the list of recommended chemicals by Central Institute of Cotton Research (CICR) much before spraying claimed over 40 lives in the region.

The premier research agency of the central government issues advisories related to use of pesticide combinations on the cotton crop. Considering its hazardous nature, monocrotophos-based chemicals were removed from the list. It is already banned for use on vegetable plants.

The pesticide, however, remained the top selling product till the deaths took place. Even the manufacturers' leaflets named cotton as a recommended crop on which monocrotophos could be used. The chemical is made by a number pesticide companies.

TOI secured leaflets of a couple of brands, one of it has major market share. The papers claimed monocrotophos to be useful on the cotton crop. Although leaflets carried a prominent warning that it has been banned on vegetables.

Dr V N Waghmare, acting director of CICR, told TOI that the chemical was deleted from the list of recommended pesticides due to its hazardous nature. It happened some years before the deaths took place. However, it is still being used by the farmers here.

Almost every farm worker or farmer who died due to pesticide poisoning had been found using monocrotophos, apart from other chemicals.

On being asked if this meant that CICR had expressly issued instructions that monocrotophos should not be used, Waghmare said it was removed from the list. "Removal means that the pesticide should not be used. Since the chemical was not to be used, it was removed from list," said Waghmare.

"It also had an adverse impact on the cotton crop. Monocrotophos also acts as a

### CONTROVERSIAL PRODUCT

➤ Considering its hazardous, monocrotophos was deleted from the list of pesticides to be used on cotton

➤ Monocrotophos packets carry a red triangle mark which stands for extremely toxic chemicals



➤ It also acts like a growth booster making the plants look greener

➤ But the extra growth attracts more pests

➤ The chemical is made by a number pesticide companies

➤ The leaflets put along with the containers mention it can be used on cotton

growth booster. As the plant looks greener, it attracts sucking pests which leave the crop damaged," he said.

Farmers say they use monocrotophos against a number of pests, including bollworm. "The chemical also makes the plant look lush green and boosts its growth. Due to this, it is popular among cotton growers," said Nitin Khadse, a farmer from Jalgaon village in Yavatmal district.

There has been a major bollworm attack on the cotton crop in Yavatmal. Agriculture department officials also attribute it to excessive use of monocrotophos.

Kishore Tiwari, director of the state government's think-tank on farmers Vasantrao Naik Shetkari Swavalamban Mission (VNSSM), said, "If the chemical is being sold despite not being recommended for cotton, it is a failure of the Central Insecticide Board (CIB)," he said.

However, dealers have stopped selling the product after the deaths. "We have voluntarily returned the stock to the manufacturers as dealers are under fire after the incidents," said a pesticide trader in the city.



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