

# “Topping-mediated” VOCs emitted by cotton plants

## Electroantennogram response of two major noctuid pests

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### Introduction

Field experiments conducted in Mali showed a reduction of bollworm infestation on cotton plants topped after the onset of flowering, as well as on non-topped neighboring plants.

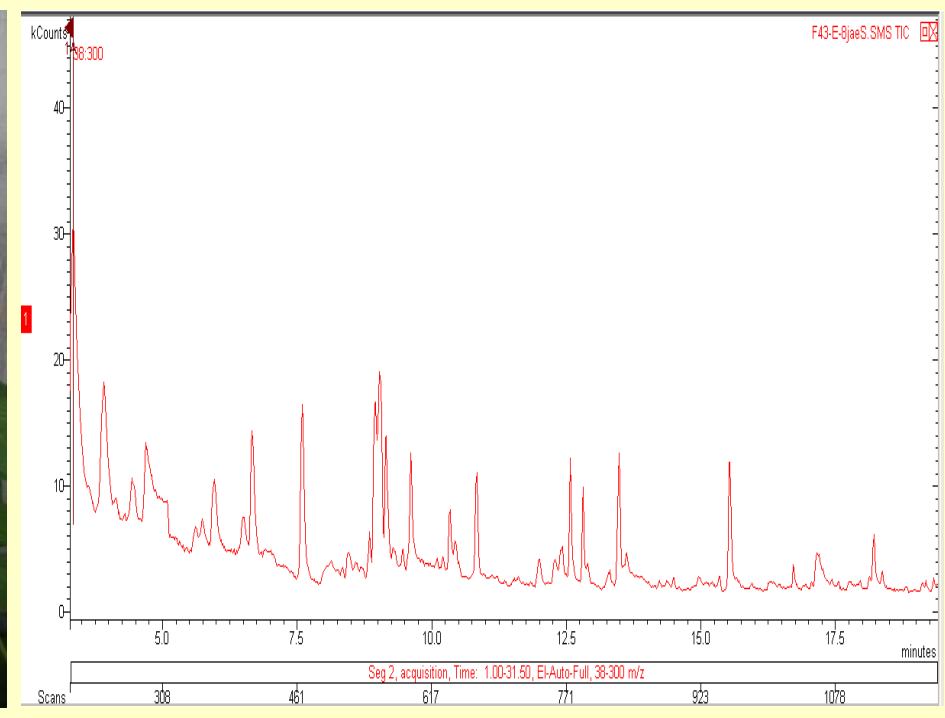
The purpose of this study was to test the hypothesis that manual topping could affect the profile of plant volatile compounds (VOCs) emitted cotton by plants, which may in return affect moth behavior.



### Material and methods

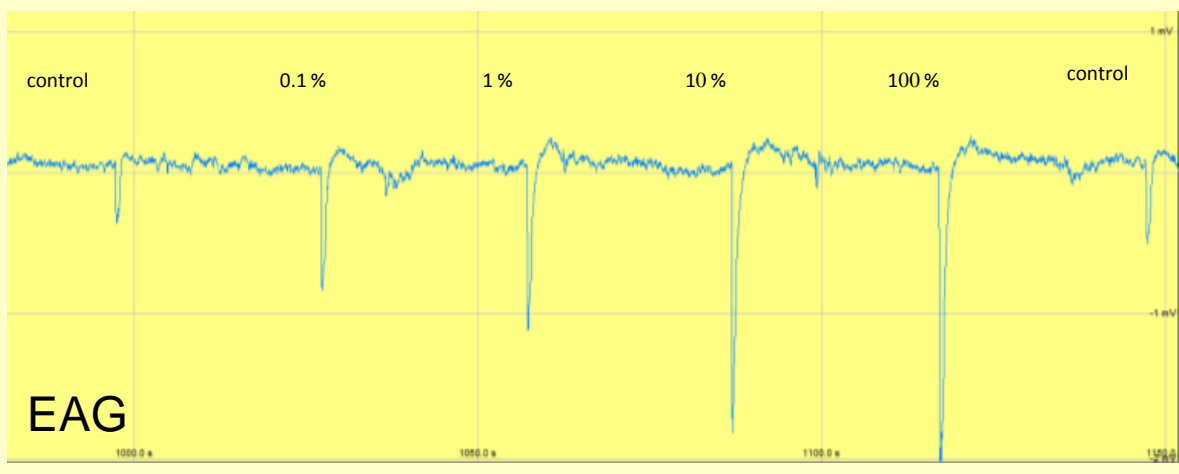
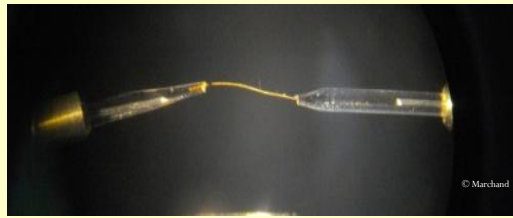
#### Odor collection and analysis

Odors were collected by SPME from topped and non-topped plants in a greenhouse, and analyzed by GC-MS techniques.



#### Electroantennogram

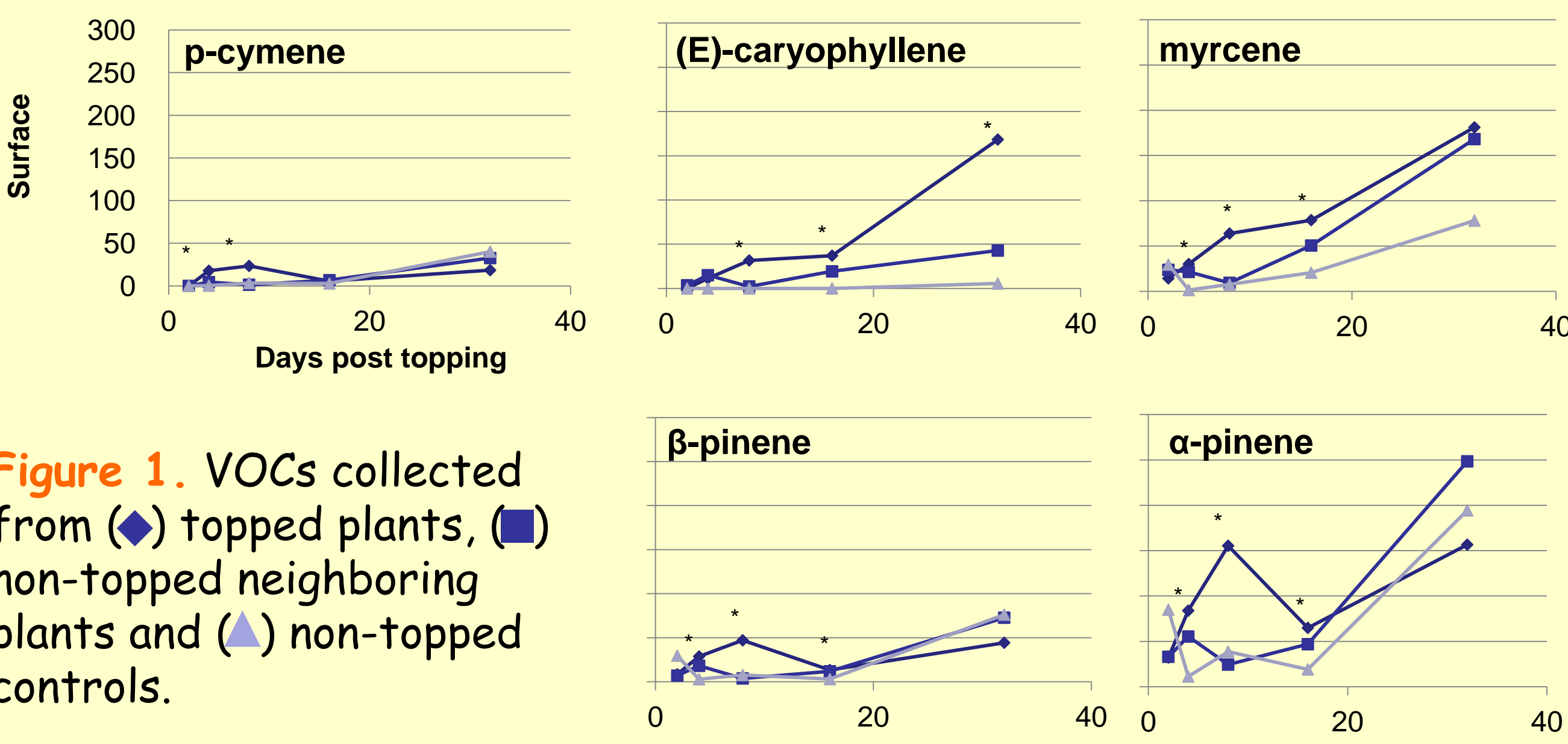
Response of *Helicoverpa armigera* and *Spodoptera littoralis* gravid females (3-7 days old) to cotton VOCs was tested using EAG techniques.



### Results

#### “Topping-mediated” VOCs

We identified five “topping-mediated” VOCs, emitted in larger amounts by topped plants 4-16 days after topping for  $\alpha$ -pinene,  $\beta$ -pinene, myrcene and p-cymene, and 8-32 days after topping for (E)-caryophyllene (Fig. 1).



The concurrent increase of these VOCs from non-topped neighboring plants also suggests partial induction.

#### EAG response

Electroantennography on gravid *Helicoverpa armigera* and *Spodoptera littoralis* females (Lepidoptera: Noctuidae) showed that moths can detect topping-mediated VOCs (Fig. 2).

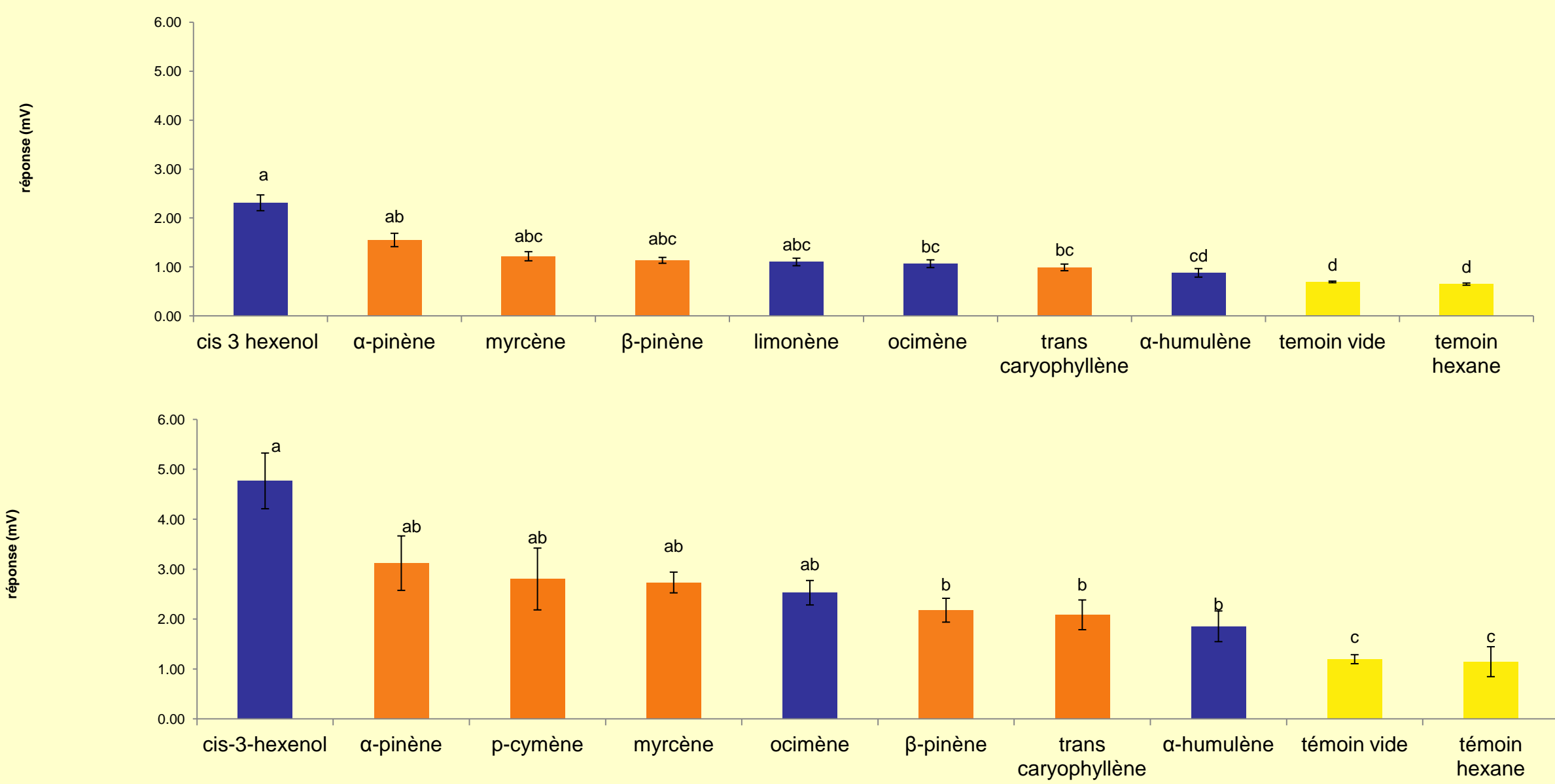


Figure 3. EAG response of *S. littoralis* (top) and *H. armigera* (down) to VOCs emitted by cotton (in orange: topping-mediated compounds).

### Conclusion

Behavioral tests should be conducted to evaluate possible deterrence of topping-mediated VOCs for egg-laying females and attraction for parasitoids. Induction of non-topped plants suggests high potential for integrated pest management.