Integrated Pest Management (IPM) 2018 Sub-Group Report

Coordinator: Anne Jack, UK, USA
SC Liaison: Colin Fisher, UK, USA

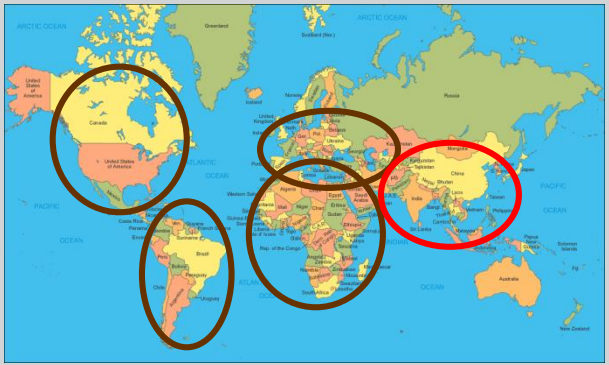
Kunming, 23 October 2018

2018 Kunming Meeting

- **Meeting Sunday 21 October 2018**
  - **21 attendees**
  - **Appeals**
    - Help with editing (ideally native English speakers)
    - Reviewers (need not be native English speakers – technical content)
    - Authors for missing chapters
    - Photographs
  - **New members always welcome**
- **Anyone who missed the meeting**
  - **If you are interested – please contact me**
  - **Here or at amjack2@uky.edu**

Integrated Pest Management (IPM) SG History & Background

- **Membership consistently >90**
  - **Academic – universities & research stations; researchers & extension**
  - **Industry – leaf dealers & manufacturers**
- **Currently**
  - **154 members**
  - **29 countries**
    - Need more Asian representation
    - Especially India & China



Objectives

- **IPM is defined by the American Phytopathology Society as:**
  - **"A sustainable approach to managing pests by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health and environmental risks".**
- **Objectives**
  - **To summarize available IPM strategies for each pest & disease**
  - **To produce a document for agronomists & farmers**
    - structured by disease or pest
    - with a common outline framework based on relevant IPM methods
  - **To make document available on CORESTA website in pdf format**

Value of Previous IPM Work

- **IPM is not new – INTEGRATED management system**
  - **Zimbabwe, TRB handbook 1950's recommended**
    - Rotation for nematode control
    - Hygiene for TMV control
    - Avoiding over-fertilization for bacterial foliar disease control
  - **US grower guides 1940's recommended**
    - Rotation & hygiene for black shank control
    - Hygiene for TMV control
- **Some new IPM strategies**
  - **Mostly built on well-established principles**

How This Work Helps the Scientific Community

- **Lower CPA residues – BIG issue for tobacco industry**
  - **CPAs may be replaced or partly replaced by other strategies**
  - **Lower levels applied**
    - Scouting
    - Proper application
    - Less disease

How This Work Helps the Scientific Community

- **Lower CPA residues – BIG issue for tobacco industry**
  - **CPAs may be replaced or partly replaced by other strategies**
  - **Lower levels applied**
    - Scouting
    - Proper application
    - Less disease

- **Lower diseases/pest populations – resulting easier control, less CPAs**
  - **Rotations, good hygiene etc.**
    - Prevent or slow build-up of diseases / pests
- **Sustainable production – soils, disease/pest levels, flora/fauna**
  - **Will we be growing tobacco 20 years from now?**

IPM Task Force Members

- **Members**
  - Authors
  - Reviewers
  - Contributors of photographs
  - Observers, commentators
- **64 plant protection specialists**
  - 31 pathologists
  - 24 entomologists
  - 8 nematologists
  - 6 weed scientists


A.2. Bacterial Diseases

16. **Wildfire, angular leaf spot** *Pseudomonas syringae* pv. *tabaci* tox+, tox-
Anne Jack, University of Kentucky, USA

General

These diseases can affect tobacco in both the seedbeds / float trays and the field, although wildfire (tox+) tends to be more of a problem in the seedbed and angular leaf spot (tox-) in the field. Wildfire and angular leaf spot are not major problems in many tobacco producing areas, such as the USA, Brazil and Europe. In Africa, they are diseases of major importance which can cause devastating losses, especially in wet seasons. All control measures discussed refer only to areas where they are diseases of economic importance, and are not usually necessary in areas such as the USA.

Symptoms

The symptoms of the tox+ (toxin producing) and tox- forms of this disease are quite different. Wildfire (tox+) is characterized by a small brown or black watersoaked lesion, surrounded by a chlorotic halo (Figure 16.1). Wildfire can be systemic in seedlings, causing distortion (Figure 16.4). The angular (tox-) lesion is brown, dark brown or black, much larger than the wildfire lesion, has little or no chlorotic halo, and has angular margins because the lesion is confined by the lateral veins (Figure 16.2). In Africa, both diseases tend to be more severe at the top of the plant (Figures 16.1, 16.2).

Source and Transmission

Bacteria are spread within the field, from field to field and from infected weed hosts in wind-driven water droplets. Driving rains exacerbate the problem considerably. These diseases can also be seed transmitted. Debris from infected plants is a source of inoculum, as it infects overwintering weed hosts. In the semi-tropical areas where these diseases are a problem, winters are seldom cold enough to kill overwintering weeds.

Site Selection


IPM Taskforce

Home
Taskforce Overview
Working Documents
IPM Images
Completed Documents
IPM Presentations
Final Report
Useful Links

As each completed chapter has been reviewed and edited, it will be placed on this page for general review by the taskforce. Members will be notified by email when a document has been posted online. Please perusse any documents which are of interest to you, and let us know if you have any comments.

We would encourage those of you with experience of any particular topic to comment and contribute, especially if you know of any IPM strategy which has been omitted. We are particularly interested in a global perspective and welcome suggestions of different strategies from our diverse membership.

Each document will be posted online for one month. The post date and expiration date included in the table below will also be in the notification email. Please send comments to the author using the **Comments** link in the table; these comments will be automatically copied to the section leader (see Taskforce Overview page for assistance) and the taskforce coordinator.

10/21/15: There are currently no chapters for website review, but several chapters will be posted shortly.

Document Name	Post Date	Expires	Author	Reviewer 1	Reviewer 2	*Comments: please contact

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Fig 16.3: Susceptible variety (left), resistant variety (right). A: angular B: wildfire
Michelle du Toit, Zimbabwe

Fig 16.4: Systemic wildfire on seedlings
Michelle du Toit, Zimbabwe

General

- **Communication**
  - **Email**
  - **Annual meetings at conferences**
- **Executives**
  - **Editors**
    - Anne Jack, Colin Fisher (UK, USA)
  - **Group leaders**
    - Emily Pfeufer (UK, USA)
    - Chuck Johnson (VT, USA)
    - Paul Semptner, (VT, USA)
    - Andy Bailey (UK, USA)
    - Cecilia Dorfey (JTI, Germany)





Task Force Structure

- 80 chapters over 5 groups
  - diseases
  - nematodes
  - insects
  - weeds
  - IPM strategies
- Each with a group leader
  - organizes group
  - collects chapters
  - arranges reviews





Task Force Approach

Same approach for 3 groups

Diseases

fungal
bacterial
viral
seedling
post-harv

Nematodes

Insects

- Groups divided into sections
- Chapter for each disease or pest

Task Force Approach

Weeds group

Field Weeds

Parasitic Weeds

Different approach

- **Principles of weed control**
- **Specific weed problems**

IPM Strategies

Biological Control

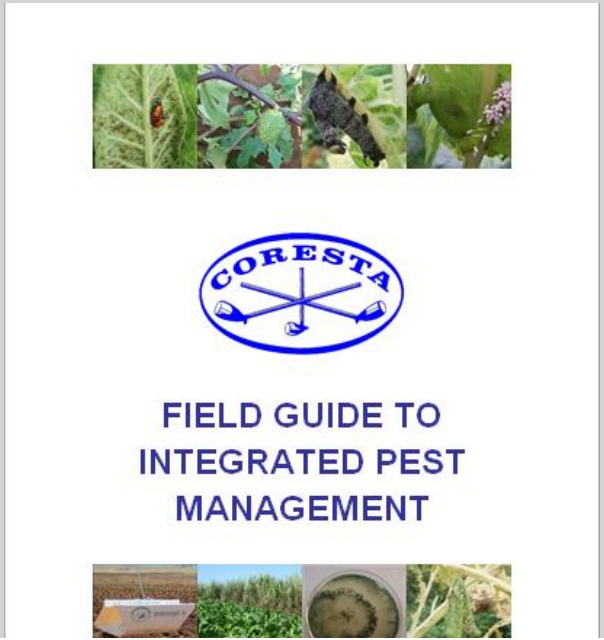
Rotation

Correct CPA Usage

- **Sections deal with general IPM principles**

On-Going Work

- **Final product**
  - **Digital document**
  - **Downloadable PDF**
    - Continually updated



About to be updated

Remaining Work

- **Collect outstanding chapters**
  - **Some not done, some in progress**
    - Some new chapters received
    - New authors, still need some authors
- **Complete outstanding reviews, editing**
  - **Currently in progress**
    - Still need some reviewers
  - **3 chapters ready for website review**
- **Document posted incomplete**
  - **Task Force → Sub-Group**
    - Add completed chapters, update existing

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Completed Documents

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Final Document: Samples

FIELD GUIDE TO INTEGRATED PEST MANAGEMENT

Updated 22 October, 2015

INTEGRATED DISEASE MANAGEMENT

Updated 22 October, 2015

A.2. Bacterial Diseases

15. Wildfire, Angular Leaf Spot *Pseudomonas syringae* pv. *tabaci* tox+, tox-
(formerly known as *P. tabaci*, *P. angulata*; also *P. syringae* pv. *tabaci*, *P. syringae* pv. *angulata*)

Anne Jack, University of Kentucky, USA

General

Wildfire and angular leaf spot can affect tobacco in both the seedbeds / float trays and the field, although wildfire tends to be more of a problem in the seedbed and angular leaf spot in the field. Wildfire and angular leaf spot are not major problems in many tobacco producing areas, such as the USA, Brazil and Europe. In Africa, they are diseases of major importance which can cause devastating losses, especially in wet seasons. The bacteria that cause wildfire and angular leaf spot are identical in all respects except that the wildfire bacteria produce a toxin and the angular bacteria do not. Wildfire is therefore caused by the "tox+" strain and angular leaf spot by the "tox-" strain.

Symptoms

The symptoms of the tox+ (toxin producing) and tox- (non-toxin producing) forms of this disease are quite different.

Wildfire (tox+) is characterized by a small brown or black watersoaked lesion, surrounded by a broad chlorotic halo (Figs. 15.1A, 15.2). The lesions increase in diameter and may coalesce until the diseased tissue eventually falls out leaving ragged holes. Wildfire can be systemic in seedlings, causing distortion (Fig. 15.4) of the apical bud and leaves.

The angular (tox-) lesion is brown, dark brown or black, much larger than the wildfire lesion, has little or no chlorotic halo, and has angular margins because the lesion is confined by the lateral veins (Figs.15.1B, 15.3, 15.5). In Africa, both diseases tend to be more severe at the top of the plant (Figs. 15.2, 15.3).

Source and Transmission

The bacteria are spread in wind-driven water droplets, from leaf to leaf and plant to plant within the field, from field to field and from infected weed hosts or tobacco regrowth. Driving rains and sand blasting winds exacerbate the problem considerably. These diseases can also be seed transmitted. Tobacco regrowth and debris from infected plants should always be destroyed at the end of the season, as they are sources of inoculum to infect overwintering weed hosts. In the semi-tropical areas where these diseases are a problem, winters are seldom cold enough to kill overwintering weeds and tobacco regrowth. Wildfire and angular leaf spot are favoured by cloudy wet weather.

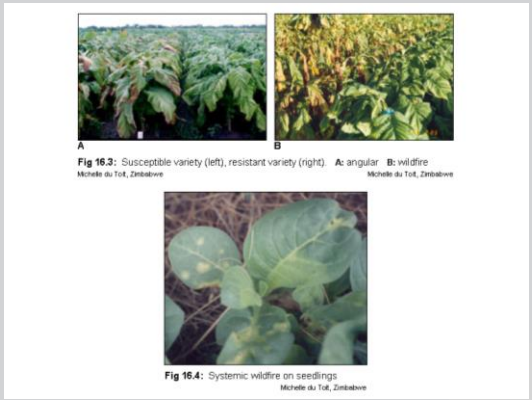
Rotation and Site Selection

Disease spread is reduced by planting earlier fields downwind of later planted fields, the earlier planted fields often serve as an inoculum source. These diseases are generally worse in intensively used fields, and can be minimised by suitable rotations (Ch. 77).

Alternate Hosts

Many solanaceous weeds are hosts of this pathogen (Ch. 61). Examples are Apple of Peru (*Nicandra physaloides*) and Jimson weed / Stinkblaar (*Datura stramonium*), shown in Fig.15.6. Such weeds should be removed from the proximity of the fields and especially seedbeds / greenhouses. This is particularly important in areas which do not have killing winter frosts, where weeds overwinter.

Acknowledgements

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Site Selection

- Our many members
  - Photo contributors
  - Reviewers
  - Especially authors
- CORESTA

THANK YOU