COMBINED USE OF PHOSMET AND NEW CROPPING SYSTEMS TO CONTROL CABBAGE STEM FLEA BEETLES (*PSYLLIODES CHRYSOCEPHALA*)

March 2015

March 2016

Luc WESTERLOPPE – Gowan Crop Protection
EU Technical – Development Manager for Oilseed crops

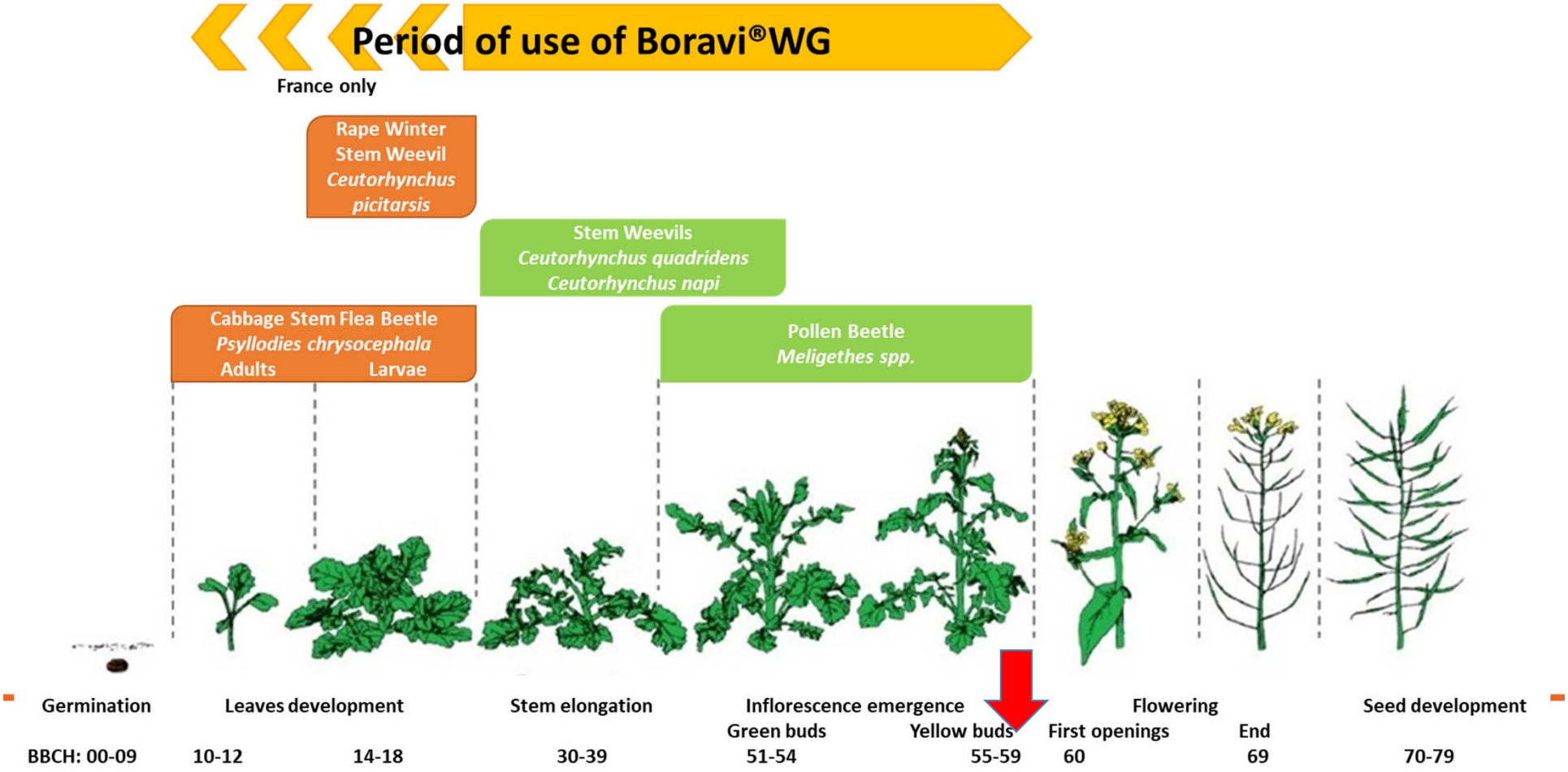
BoraviWG® IDENTITY

WG formulation containing 50% of Phosmet

Organophosphate insecticide (IRAC group 1B) acting by contact and ingestion.

CLP classification : Danger – Category 1 - H301, H318, H410

France : 2 applications / season / 7-days interval



CABBAGE STEM FLEA BEETLE
LIFE CYCLE

Adults move to new OSR crops for feeding (Sept-Oct).
And lay their eggs on soil at the bottom of the plants (Oct-Nov)

Autumn

After hatching, larvae climb on plants and colonize the petioles (and stems)

petioles

Winter

stems

Spring

From June to July, new adult generation feeds on plants (leaves and pods).

Summer

Adult in summer diapause.

Larvae leave stems to pupate into the soil.

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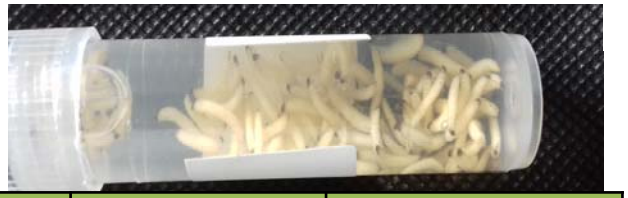
RESISTANCE TO PYRETHROIDS

PCR - TERRES INOVIA



Country / year	Origine	% KDR	% Super-KDR
		RR	RR
UK / 2016	Boxworth (Cambridgeshire)	45	0
UK / 2016	Swaffham Prior (Cambridgeshire)	60	0
UK / 2017	Elton-on-the-Hill (Nottinghamshire)	76,5	0
UK / 2017	Bucknell (Oxfordshire)	57,9	0
UK / 2017	Blo Norton (Suffolk)	73,7	0
UK / 2017	Devizes (Wiltshire)	26,3	0
DE / 2017	Kuhlrade (North East)	100	0
DE / 2017	Neschow (North East)	100	0
DE / 2017	Warnkenhagen (North East)	100	0
FR / 2016	Auchy-la -Montagne (60360)	85	0
FR / 2017	Catillon-Fumechon (60130)	100	0
FR / 2016	Saint Victor (47140)	86	0
FR /2016	Moulin-en-Tonnerrois (89310)	5	80
FR / 2016	Nitry (89310)	0	70
FR / 2017	Foret-Bréault (89310)	13,3	86,7
FR / 2017	Bonnard (89400)	15	35

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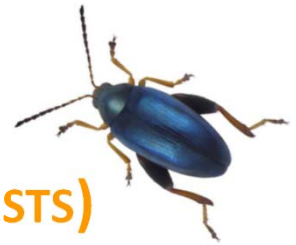
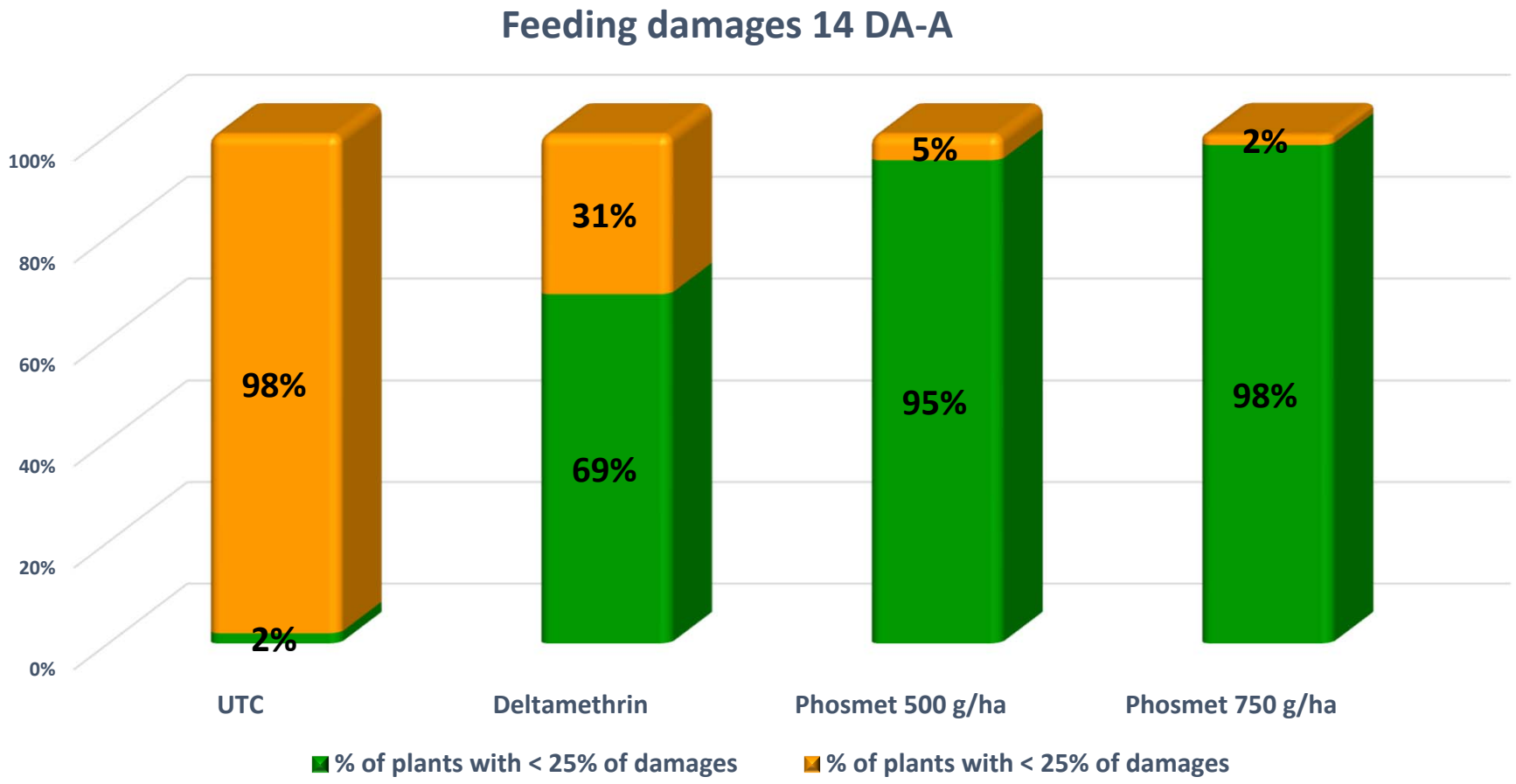
TRIAL TARGETING ADULTS 2016:

TERRES INOVIA C16LLA47003 - SAINT VICTOR (SOUTH EAST)

KDR : 86% RR +/- METABOLIC (MORTALITY OF 80 TO 100% IN VIAL TESTS)

APPLICATION SEPTEMBER 25TH - BBCH 10-11 / 30% OF ATTACKED PLANTS





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TRIAL TARGETING LARVAE (2016)

BPE16030IGC01 MOULINS-EN-TONNERROIS(BURGUNDY)

SUPER KDR 80% RR + KDR 5%RR + METABOLIC RESISTANCE

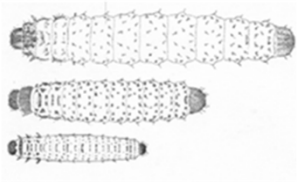

Photo 25/11

Until Oct 12, insects' pressure was low, but in Oct 19, yellow traps have shown high population of *Ceutorynchus picitarsis* (> 20/ trap) and CSFB adults (15/ trap).

Photo 5 avril

As in this area, the risk of pyrethroids'resistance for *C. picitarsis* is also very high, decision was taken to apply experimental treatments 2 times.

TA : 19/10/2015 *C. picitarsis adults*
TB : 12/11/2015 CSFB larvae (1,5 / plant)
C. picitarsis larvae (0,8 / plant)

UNTREATED **Boravi WG 1,5 kg**

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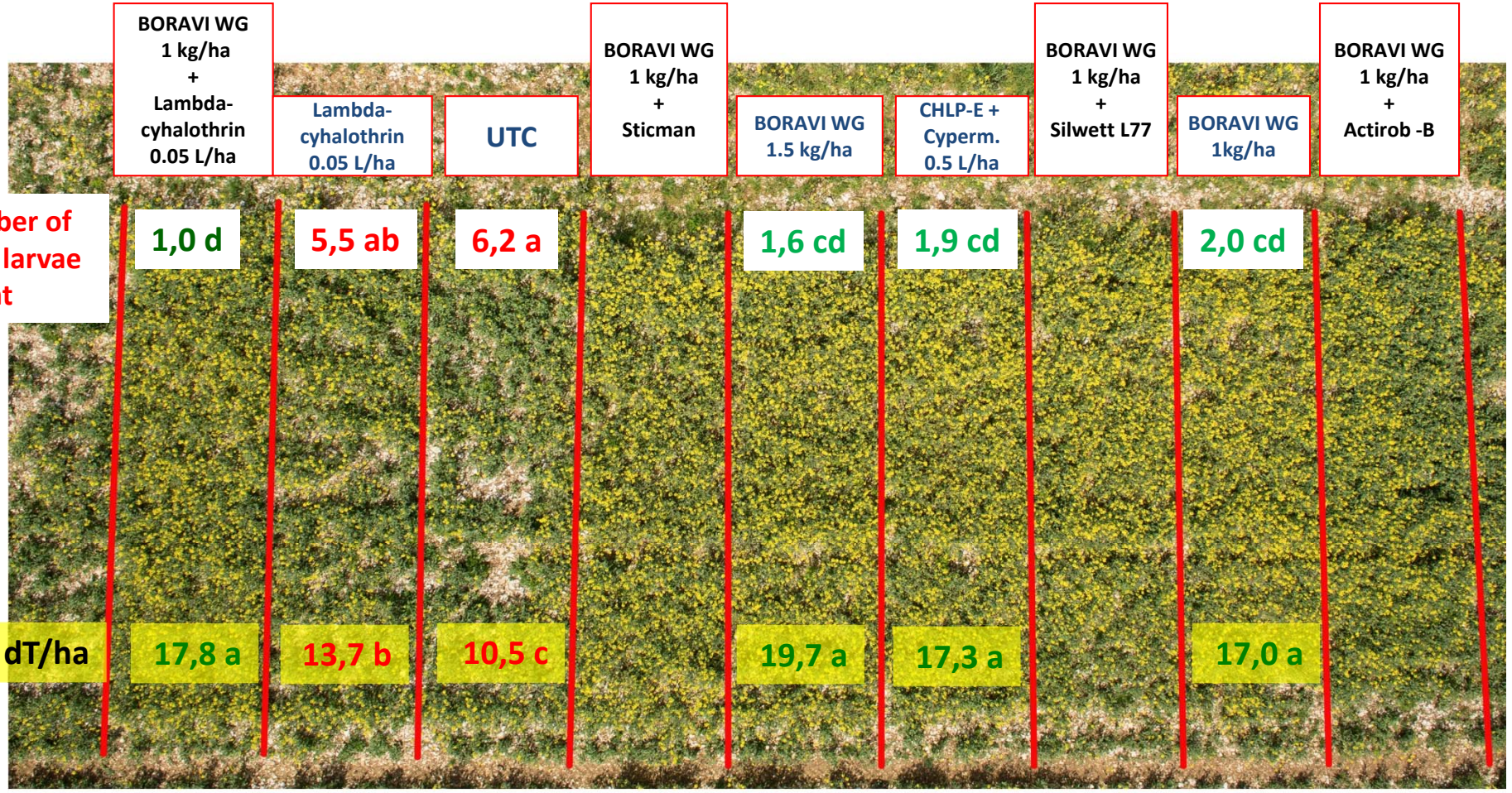

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Répétition 4/4

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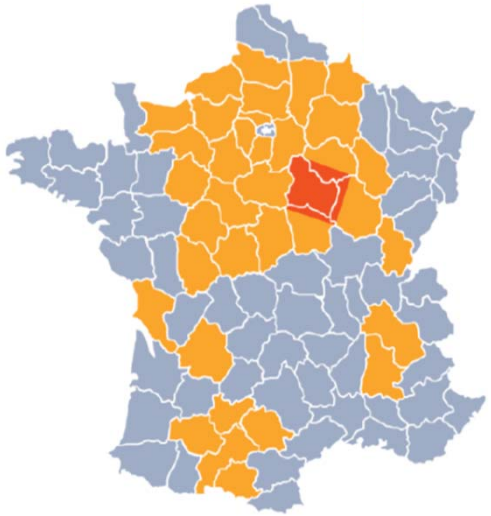
BASED ON TRIAL'S RESULTS, THERE IS A STRONG TEMPTATION TO APPLY BORAVI WG AGAINST BOTH ADULTS AND LARVAE IN SOME AREA.



CHLP : chlorpyriphos-methyl
Pyr : Pyrethroids

CSFB resistance status	CSFB adults	Ceutorynchus picitarsis	CSFB larvae
Timing	End of Sept / Beginning of Oct	Mid-Oct	Nov
Sensitive or partial resistance (Kdr +/- metabolic)	Phosmet	Pyr.	CHLP + Pyr.
			Phosmet
		CHLP + Pyr	Pyr.
			Phosmet
High resistance (Super Kdr + metabolic)	Phosmet	CHLP + Pyr	Phosmet

How to avoid a rapid development of resistance to Phosmet and globally to organophosphates ?
By reducing unnecessary applications

- By demonstrating interest in agronomic practices (better crop's implementation)
- By supporting farmers for insecticide applications (right timing / larvae).

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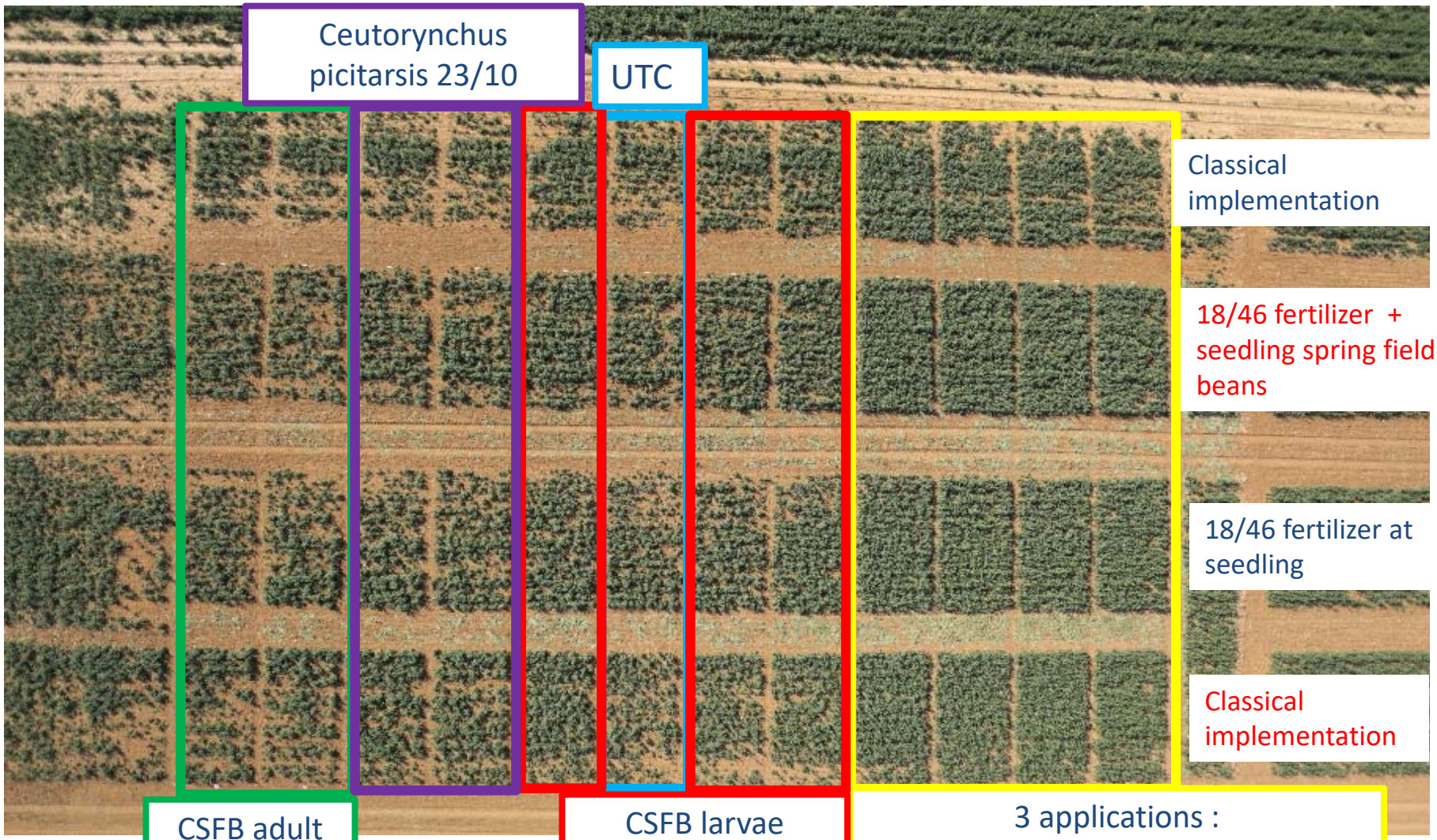
AGRONOMICAL TRIAL OF FORÊT BRÉAULT (2016/17)
PICTURES OF 30/03/2017



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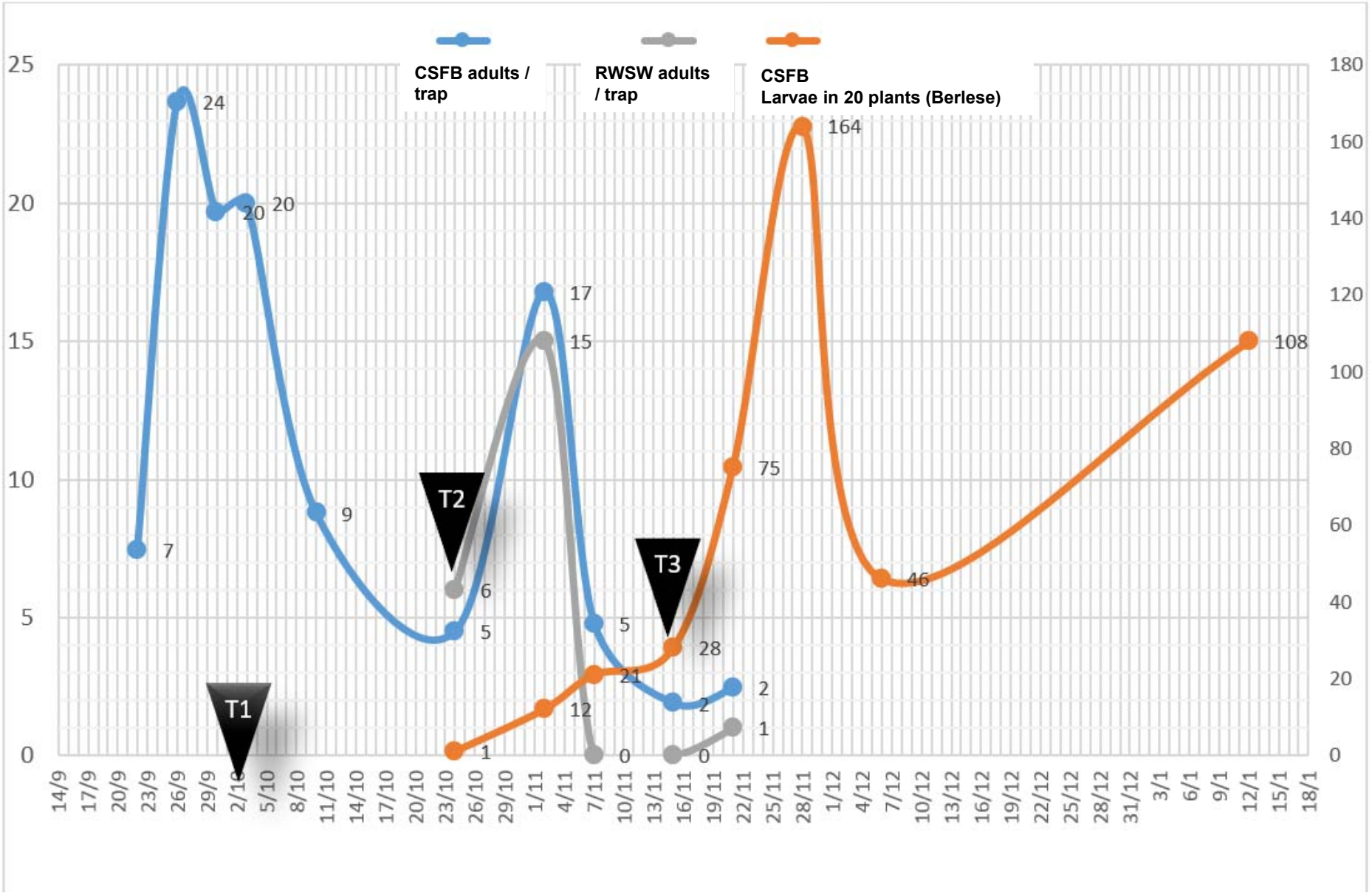
AGRONOMICAL TRIAL OF FORÊT BRÉAULT (2016/17)
WHEN SPRAY INSECTICIDES ?

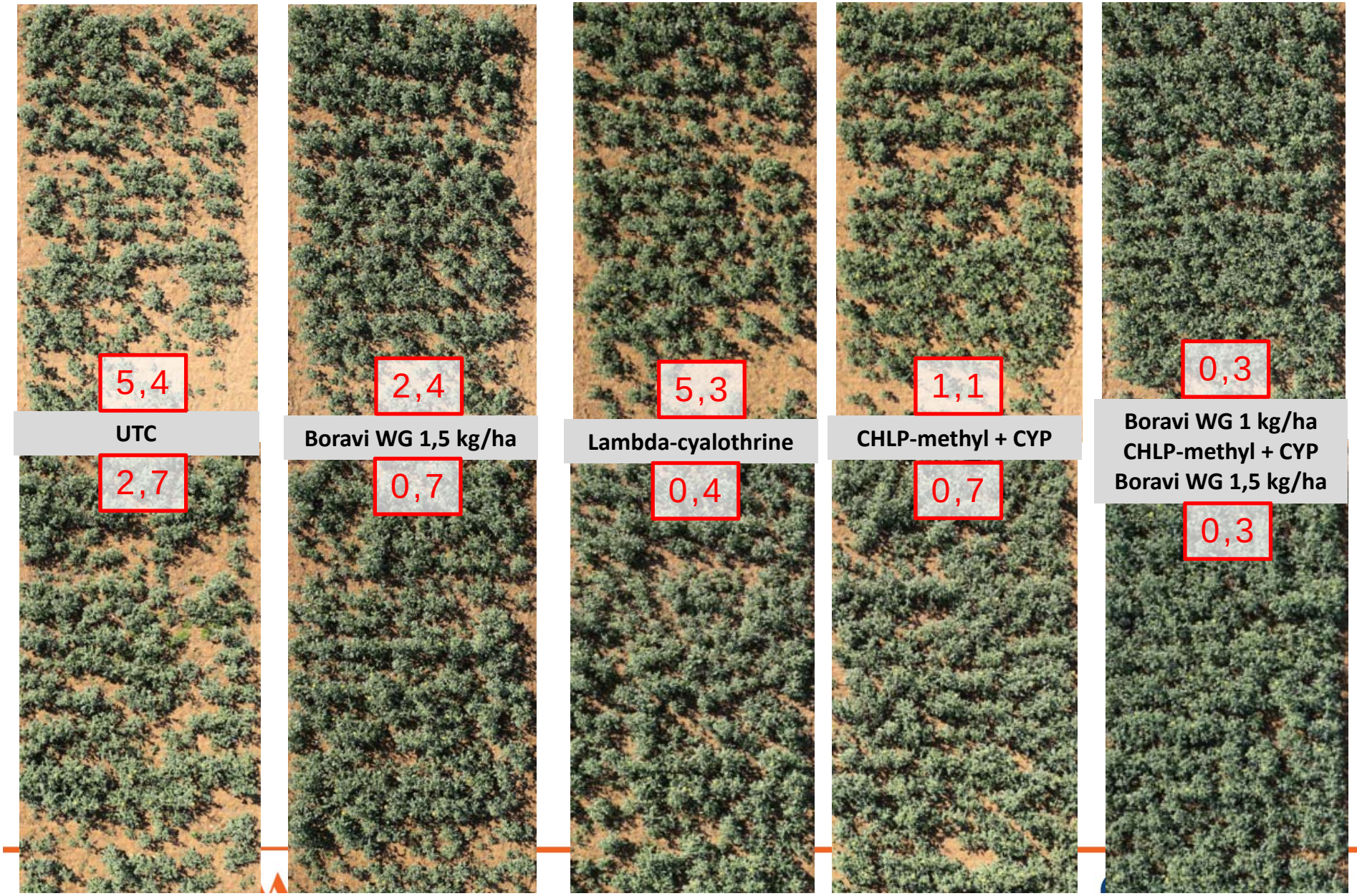
Relevé des vols de ravageurs / ***Details of pest's flights***



Picture 30/03/2017 **1 application against CSFB larvae 14/11/16**

3 applications 3/10, 23/10, 14/11

normal seedling

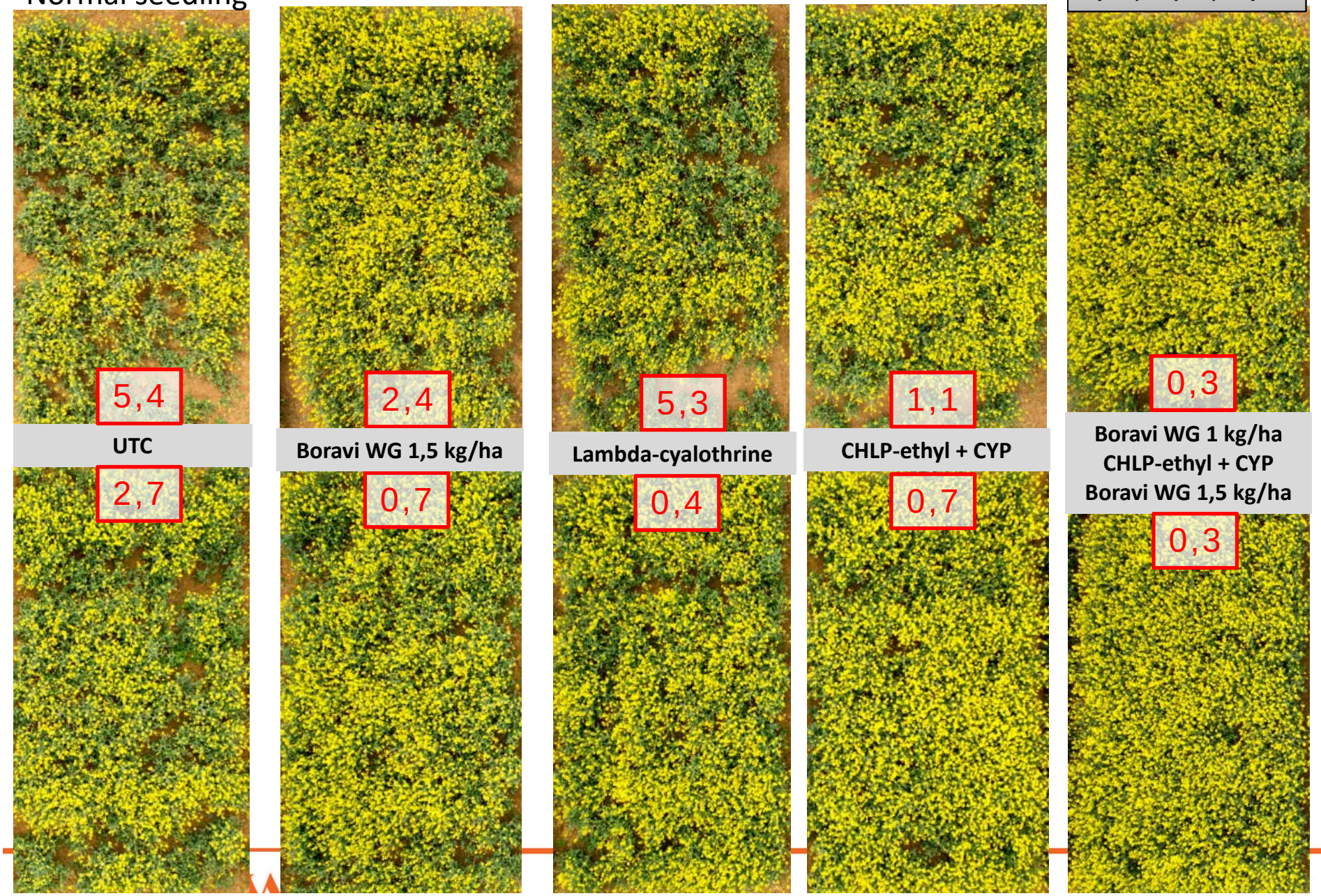


OSR with spring field beans' seedling and 18/46 fertilizer

Number of larvae / plant (21/01)

Picture 18/04/2017 — **1 application against CSFB larvae 14/11/16** — **3 applications 3/10, 23/10, 14/11**

Normal seedling

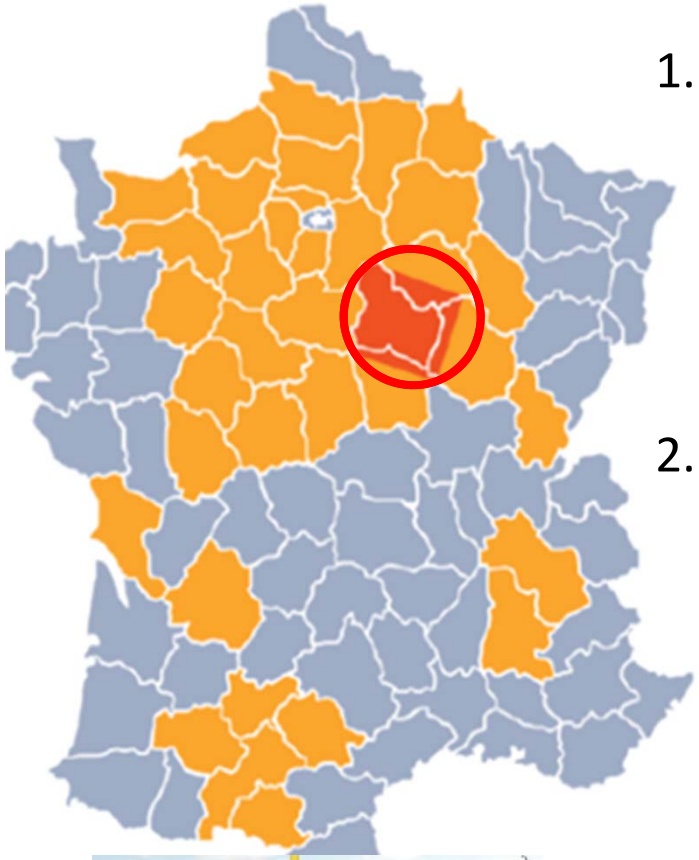


OSR with spring field beans' seedling and 18/46 fertilizer

Number of larvae / plant (21/01)

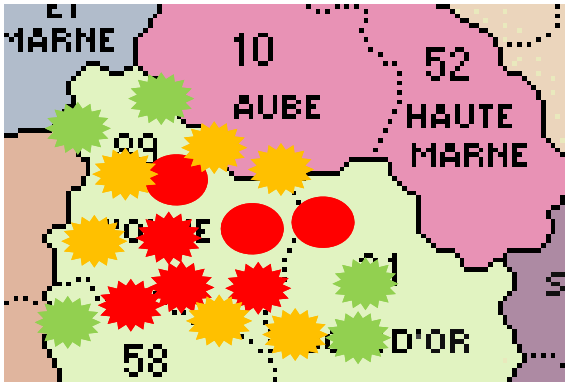
SUPPORT FOR FARMERS TO USE EFFECTIVELYBORAVI WG (AUTOMN 2017)

From October to Mid-November , monitoring of 67 plots with an untreated area :



1. Regular counting of larvae per plant by using Berlèse technique to improve positioning of the larvae's sprays.

2. Sending information to concerned distributors as risk maps (every monday) with a reminder of the treatment thresholds.



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THANK YOU FOR YOUR ATTENTION

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