

**CORN, COTTON AND SOYBEAN:
INSECT MANAGEMENT IN
SOUTHERN REGION (SP and MS-
East)**

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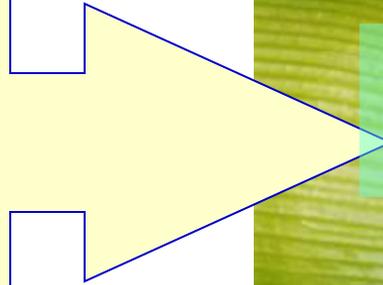
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Southern Region

- Intensive agriculture
- Extensive areas
- Monoculture
- Successive crops
- biological bridges



Increase doses - use of tank mix - more applications

High Risk of developing Resistance

CROPS SYSTEMS

Pests

Tobacco budworm

Spodoptera spp.

Cotton leafworm

Soybean looper

Mites (Tetranychideos)

Whitefly

Bugs

Bollweevil

White grubs

brown burrower bug

Sugarcane giant borer

Western Bean Cutworm

Helicoverpa sp

Commons Hosts

soybean and cotton

corn, soybean, cotton and millet

cotton

bean, soybean, cotton and potato

soybean and cotton

bean, soybean, cotton, vegetables and others (corn)

Soybean, corn and cotton

cotton

Soybean, corn and cotton

Soybean, corn and pasture

sugarcane

Corn, Soybean and bean

Cotton, Corn, Soybean and bean

Successive and concomitant crops

Ratoon crops
Volunteer plants
Tomato
Sorghum
Sunflower
Peanut
Sugar cane

Aug: millet / summer bean

-Sep: millet/ precocious soybean/summer bean

-Oct: millet/soybean

-Nov: summer corn/soybean

-Dez: cotton/soybean/summer corn

-Jan: soybean/cotton/summer corn/autumn bean

-Feb: soybean/cotton/summer corn/narrow cotton/autumn bean

-Mar: soybean/cotton/summer corn/autumn corn/narrow cotton

-Apr.: cotton/autumn corn/narrow cotton

-May: cotton/autumn corn/narrow cotton/winter bean

-Jun: cotton/autumn corn/narrow cotton/irrigated corn/winter bean

-Jul: cotton/autumn corn/narrow cotton/irrigated corn

Successive and concomitant crops

AUG SEP OCT NOV DEZ JAN FEB MAR APR MAY JUN JUL



- Ratoon crops
- Volunteer plants
- Tomato
- Sorghum
- Sunflower
- Peanut
- Sugar cane

TROPICAL AGRICULTURE E IPM

-DISPERSION

-SUPPLYING CROP  RECEIVING CROP

-CONSTANTE REDISTRIBUTION

-ALTERNATIVE HOSTS

TROPICAL AGRICULTURE E MIP



Spodoptera spp



Spodoptera spp
Helicoverpa

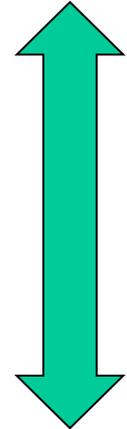
Spodoptera
Pseudoplusia



STRAW

MILLET

Heliothis
Helicoverpa



Bemisia
Pseudoplusia



Heliothis
Helicoverpa
Bemisia



Lagarta-das-maçãs:

Heliothis virescens (Fabrícus, 1781) (Lepidoptera: Noctuidae)

Helicoverpa zea (Bod., 1850)

(Lepidoptera: Noctuidae)



Lagarta-das-maçãs:

Heliothis virescens (Fabrícus, 1781) (Lepidoptera: Noctuidae)

Helicoverpa zea (Bod., 1850)

(Lepidoptera: Noctuidae)



MS-EAST

	Soybean	Cotton	Corn
Planting season	02/10 a 20/11	20/12 a 20/01	15/11 a 05/03
Planting system	No-till	No-till	No-till
Varieties	Desafio rr, 5909rr	Bayer 775, 901	P30F53, DKB340, 2B710
Main Pest Species	Chrysodeixis includens, Bemisia tabaci	Chrysodeixis includens, Bemisia tabaci bollweevil	Dichelops sp, Spodoptera frugiperda
Main insecticides	Chlorantraniliprole + lambda-cyhalothrin, - Lufenuron + profenofos, -Methoxyfenoside -Flubendiamide -Acephate - neonics + pyrethroides	Chlorantraniliprole -Methoxyfenoside -Flubendiamide -Acephate - neonics + pyrethroides	-acephate -methidathion -chlorpyrifos -diflubenzuron
Pest monitoring?	Yes	Yes	No
Tank mix?	Yes	Yes	Yes
Insecticides unregistered?	Emamectin Benzoate?	Emamectin Benzoate?	No
Off-label doses	Yes	Yes	Yes
Rotation crop?	Yes	Yes	Yes
Refuge	Yes, so far	Yes	Yes

NORTHWEST - SP

	Soja	Algodão	Milho
Planting season	20/09 a 10/12		10/01 a 20/04
Planting system	No till		No till
Varieties	AS 3730 IPRO AS 3797 IPRO BMX POTÊNCIA RR, NS 7300 IPRO, NS 7209 IPRO, M 6410 IPRO, M 7110 IPRO, M 7166 IPRO.		2B 587 PW, 2B 710 PW, 2B 433 PW, DKB 390 PRO 2 DKB 290 PRO DKB 310 PRO 30 A 37 PW 30 F 53 HX
Main Pest Species	Nematodes <i>Anticarsia</i> , <i>Chrysodeixis</i> , <i>Heliothis</i> , <i>Helicoverpa</i> , <i>S eridania</i> <i>S. cosmioides</i> <i>S. frugiperda</i> Bugs whitefly Mites		<i>S. frugiperda</i> <i>Helicoverpa zea</i> Bugs Diabrotica Aphids

NORTHWEST - SP

Main insecticides	Diamidas, Triflumuron,Teflubenzuron, Metoxifenzida, Clorpirifós,Metomil,imdacloprido,abamectina		Diamida, Triflumuron,Teflubenzuron, ,Metoxifenzida, ,Metomil,imdacloprido, Espinosa.
Monitoring?	IPM: EACH 2 DAYS		IPM: EACH 2 DAYS
Tank mix?	Herbicide + insecticide + fertilizer + fungicide + miticide		Herbicide + insecticide + fertilizer + fungicide + miticide
Insecticides unregistered?	No		No
Off-label doses	yes (if the label doses do not work)		yes (if the label doses do not work)
Rotation crop?	Soybean x corn x sorghum		
Refuge	yes		no

SOUTHWEST - SP

	Soja	Algodão	Milho
Planting season	15/09 a 15/12	30/10 a 20/11	10/08 a 31/12...
Planting system	NO-TILL	NO-TILL	NO-TILL
Varieties	Msoy 5917 Ipro/ AS 3610 Ipro/ N5959 Ipro/ N5909	966/977	30F53/ 30A37/ DKB285/ AG7098
Main Pest Species	Crysoideixis Helicoverpa Bugs Whitefly	Heliothis virescens Helicoverpa armigera Mites	Spodoptera frugiperda Bugs Helicoverpa zea
Main insecticides	Diamides Thiodicarb Methomil IGR Neonics + pyrethroids	Diamides Pirethroids Neonics + Pirethroids	Diamides Spinosad Methomil/ Thiodicarb Neonics + Pirethroids
Pest monitoring?	Yes	Yes	Yes
Tank mix?	Yes	Yes	Yes
Insecticides unregistered?	Yes	Yes	Yes
Off-label doses	Yes	Yes	Yes
Rotation crop?	Yes (Bt not available)	Yes	Yes
Refuge	Yes/no	Yes	No (

Northwest – SP – Irrigation crop

	Soybean	Corn
Planting season	Out -Nov	Out- Nov(Safra)/Fev-Mar(Safrinha)
Planting System	No-till	No-till
Varieties	Nidera – NA 5909 RG BMX – Potencia RR	Ag 8061 DKB 390 DKB 290 Pioneer 30F35
Tank Mix?	yes	yes
Insecticides unregistered?	Yes	yes
Off-label doses	Yes	Yes

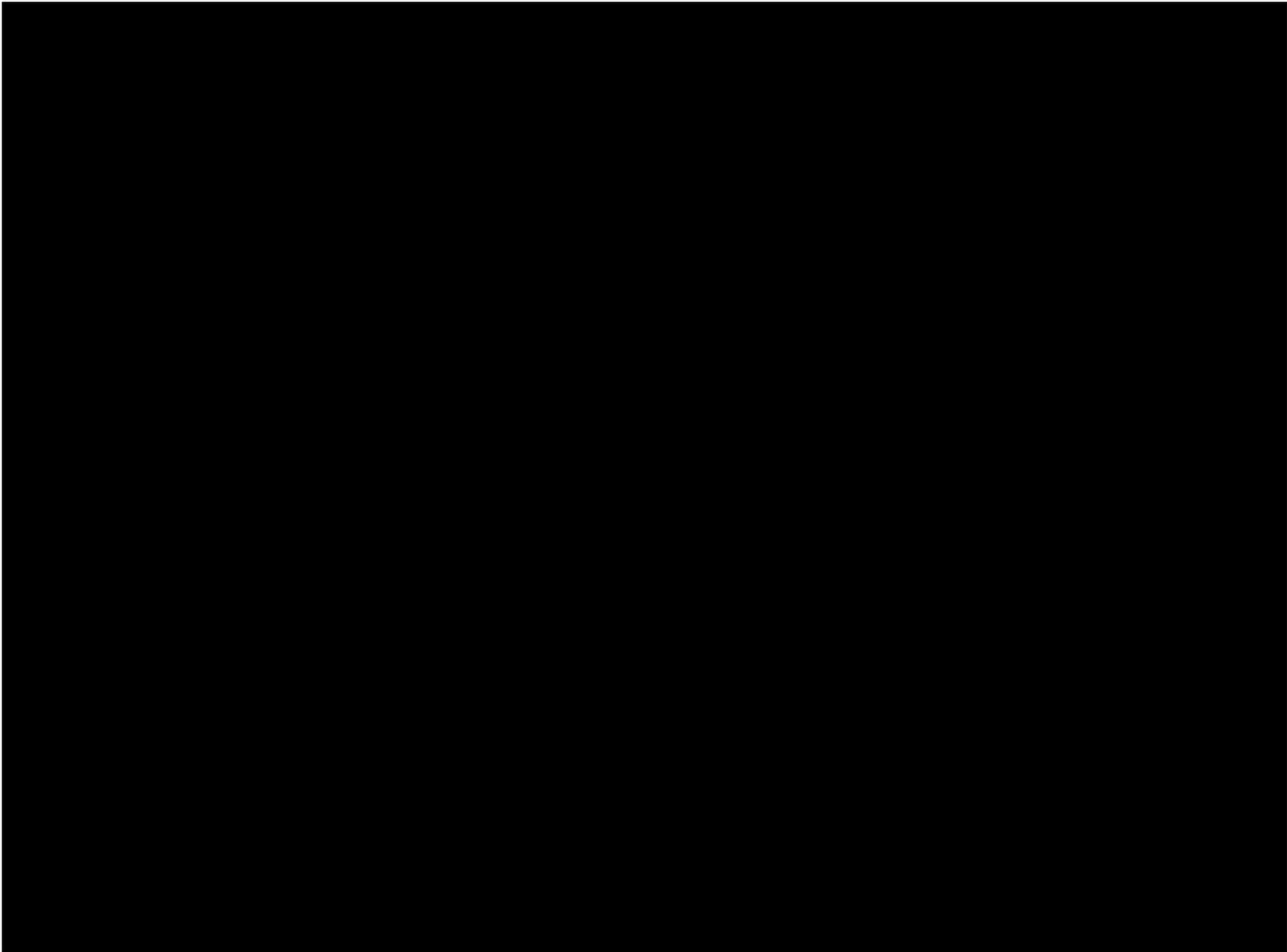
Northwest – SP – Irrigation crop

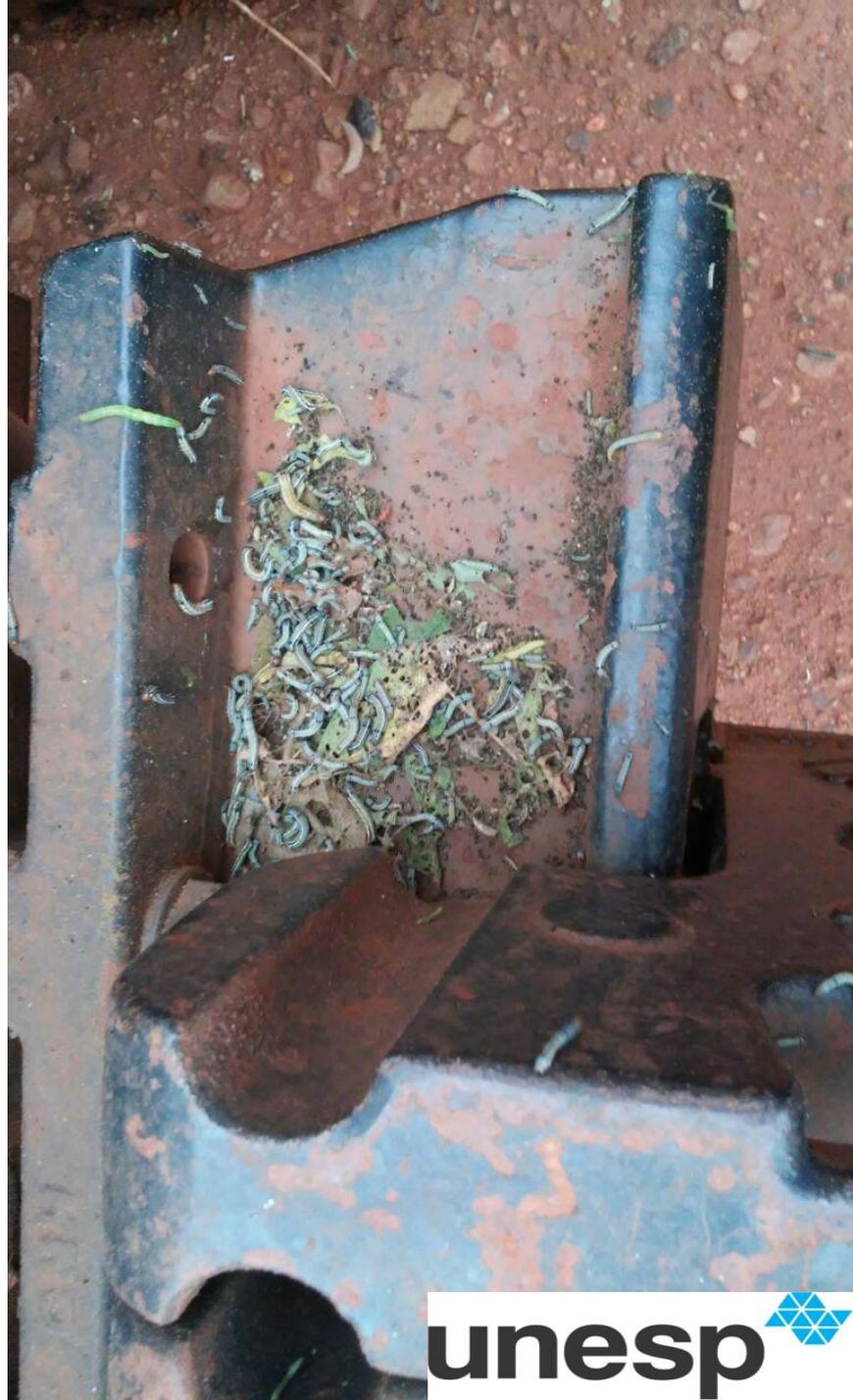
	SOJA	MILHO
Main Pests	<p style="text-align: center;"> <i>Spodoptera spp</i> Elasmopalpus <i>Crhysodeixis</i> Anticarsia Bugs Whitefly </p>	<p style="text-align: center;"> Agrotis Elasmopalpus White Grubs <i>Spodoptera furgiperda</i> Aphids </p>
Main Insecticides	<p style="text-align: center;"> Fipronil – T.S. Metomil – Dessecação Triflubenzuron Flubendiamida Clorantraniliprole Clorfenapir Betaciflutrina + imidacloprido Lambdacialotrina+tiametox an Acefato </p>	<p style="text-align: center;"> Fipronil – T.S. Metomil – Dessecação Espinosade Flubendiamida Clorantraniliprole Triflubenzuron </p>
Monitoring	Yes	Yes

Northwest – SP – Irrigation crop

Rotation crop?	Yes	yes
Refuge for Bt crops	no	













F.J. Celoto



Metodologia de aplicação

1. Contato



2. Ingestão



3. Caminhamento



Metodologia de avaliação

1. Contato



2. Ingestão



3. Caminhamento



Quantificação de formas de contaminação de diferentes inseticidas no controle do percevejo marrom, *Euschistus heros*, na cultura da soja

Tabela 1. Efeito de contato. 20 percevejos adultos por tratamento. Número de percevejos vivos pro tratamento e %E.

Tratamentos	1 hora após exposição		6 horas após exposição	
	Total	%E	Total	%E
1 – Controle	20	--	20	--
2 – Acefato	20	0	0	100
3 – Piretróide + Neonic	0	100	0	100
4 – Neonic	0	100	0	100
5 – Piretroide	0	100	0	100

Mosca-Branca – *Bemisia tabaci* Biótipo B



CONTROL DIFFICULTIES

- Genetic plasticity
- Fecundity
- Hormoligosis
- Hosts
- Overlap generations
- Adaptability for different areas
- Capacity to develop resistance
- Attack Surprise
- Control based exclusively on the chemistry

Chemical control

- KETOENOL: spiromesifen, **spirotetramat**
- JUVENILE HORMONE ANALOG: piriproxifen
- ANTHRANILIC DIAMIDE: chlrorantraniliprole , **cyantraniliprole, IKI-3106**
- NEONICOTINOIDS: acetamiprid, imidacloprid, thiamethoxam, thiacloprid, **dinotefuron**
- SULFOXIMINE: **sulfoxaflor**
- SELECTIVE FEEDING BLOCKER: pymetrozine, flonicamid, **pyrifluquinazon**
- NATURALYTE: spinosad, spinetoran
- OXADIAZINE: indoxacarb
- Mixtures
- MANAGEMENT

Insecticides advantages:

- only practical action for the control of populations of insects when these reach the damage level;
- it provides fast healing action against a visible damage or great efficiency in the preventive action;
- offers a vast range of properties, uses and application methods, for different conditions of occurrence of pests;
- it provides good economical return and use cost relatively low;
- it makes possible to the producer an isolated and independent action

among other, limitations in the medium or short period as:

- biological unbalances;
- increase population of secondary pests;
- resistance;
- residues in foods
- environmental contamination;
- risks to the sprayers;
- solution just temporary for the problems of pests occurrence.

Insecticide on the pre-plant burndown

OBJECTIVOS:

- 1) The caterpillars that survive in the straw reduce the stand of the crops significantly?
- 2) The application of insecticides in the pre-plant burndown for the no-till reduce the infestation of caterpillars significantly?
- 3) The Bt crops are damaged for the big caterpillars that survived in the straw?







FAW



FAW



FAW











Evaluations



Attack initial intense of *Agrotis ipsilon* (black cutworm)

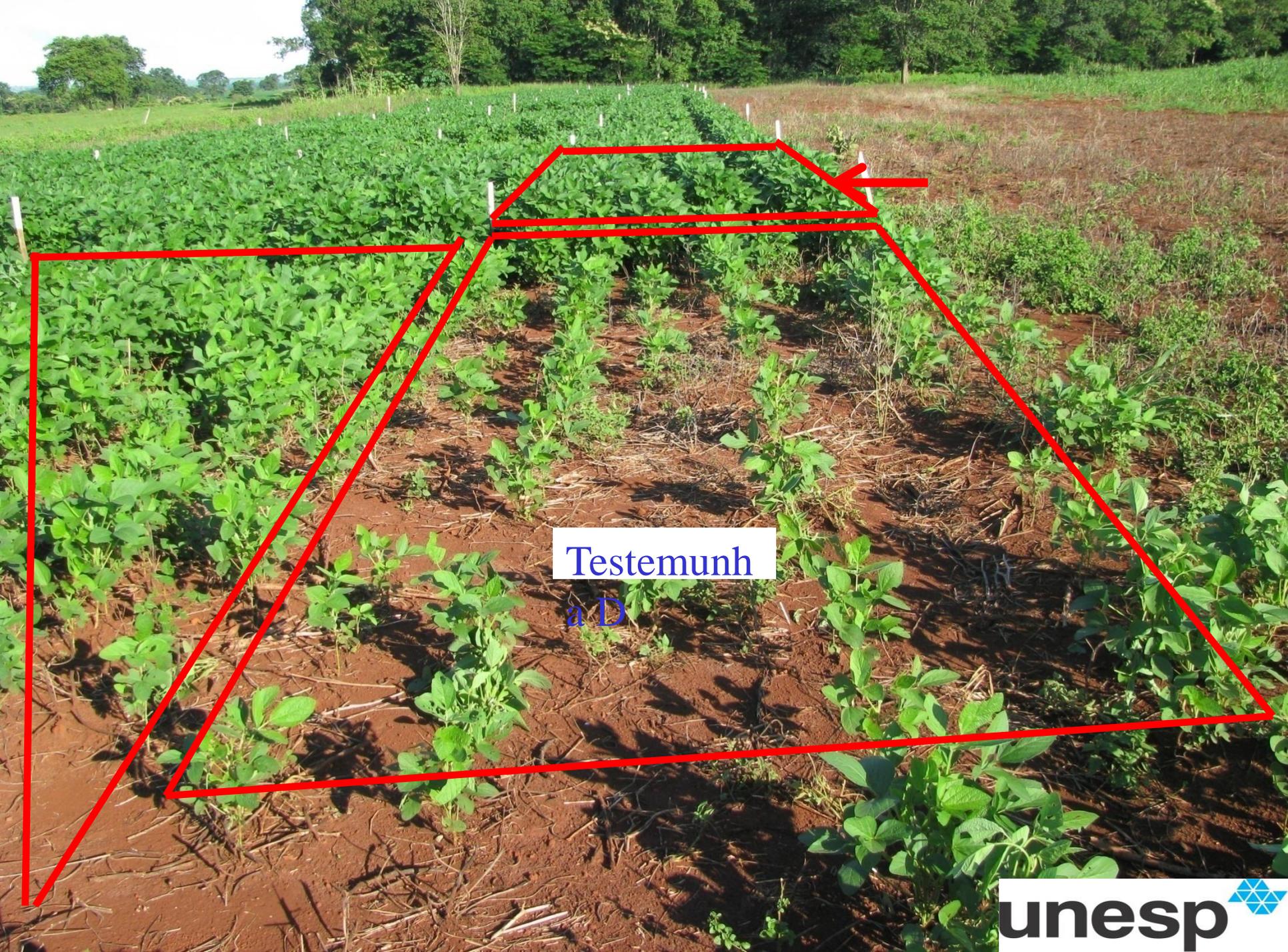


Seed treatment importance



Seed treatment importance





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pest management has not been an easy and very defined task

- resistance to several chemical groups
- increase of the use of Bt crop in cotton, corn and soy.
- great reproductive capacity
- interval among generations relatively short
- polyphagy
- crop system successive and/or concomitant
- favorable scenery for the dispersion and adaptation of the pest and evolution of the resistance to the pesticides.

MANAGEMENT PROGRAMS

- To consider characteristics of each region
- Planting calendar for each region
- Sanitary emptiness
- Control of voluntary plants
- IRM serious and efficient
- Refuge areas in Bt crop
- Pest control in crops that act as “pest suppliers” for the subsequent crop
- Use correct and safe of pesticides with regard to the label of each product are fundamental for the sustainability of the agriculture in the tropical areas.



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OBRIGADO/Thank you

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