

MANAGEMENT OF *T. palmi*, *THRIPS PALMI* KARNY USING VARIOUS CHEMICALS



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***T. Palmi* larvae on a squash leaf in a grower's field, Homestead, Florida, USA**

Treated plot



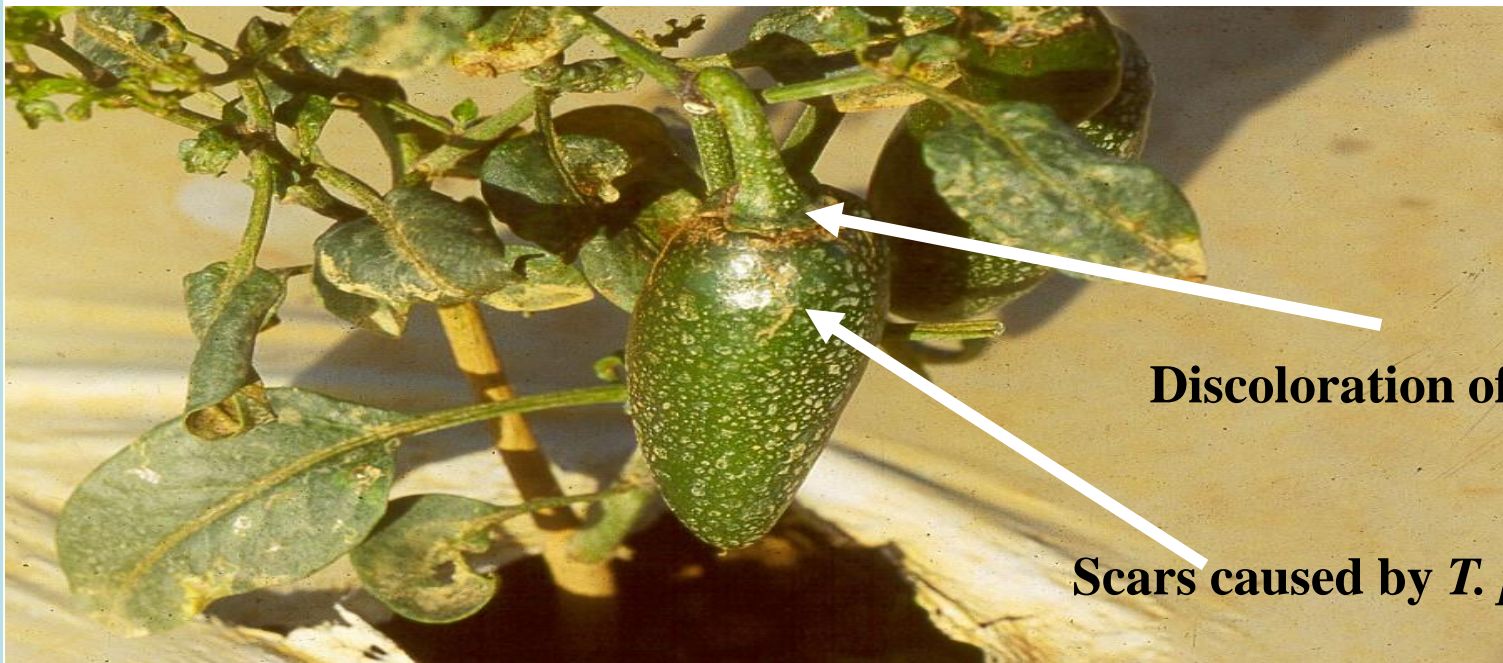
***T. palmi* defoliated bean field**



Bronzing of eggplant leaves and *T. palmi* feeding damage on fruit



**Pepper field showing start
of *T. palmi* infestation**



Discoloration of calyx

Scars caused by *T. palmi*

Geographical Distribution

- *Thrips palmi* was first described from Sumatra
- Subsequently, from Sudan, Pakistan, India, Bangladesh, Thailand, Malaya, Singapore, Indonesia, Phillipines, Hong Kong, China, Taiwan, Japan and Guam.
- Hawaii 1985; Puerto Rico 1986
- USA 1990
- Netherlands 1995

HOST CROPS OF *T. palmi*

- Solanaceae: Eggplants, pepper, potato, tobacco, ground cherry.
- Cucurbitaceae: Cucumber, watermelon, muskmelon, cantaloupe, pumpkin, bitter melon, squash, hairy gourd.
- Leguminosaceae: Kidney bean, broad bean, cowpea, soybean, etc.

OBJECTIVE

To develop a management program based on various chemicals

To re-evaluate effectiveness of Spintor in controlling *T. palmi*

Study 1

- **Crop: Cucumber**
- **Date of Planting: 22 May, 2004**
- **Plot: 2 rows, each 30 feet long**
- **Plot design: RCB with four replications.**

Treatments	Rate/a
Proclaim	1.56 gm
Proclaim	2.35 gm
Spintor	7.0 oz
Control	

Application method

- **Date of application: 17, 27 June and 6 July, 2004**
- **Method of application: Backpack sprayer with one nozzle**
- **Pressure: 30 PSI**
- **Volume: 70 GPA**

Sampling method

- **Samples were collected 24 h after each application.**
- **Sample size: 5 leaves, one leaf/plant**
- **Collection of thrips: leaves were washed with 70% alcohol to separate thrips.**

Mean numbers of *T. palmi* adults/5 leaf sample of cucumber

Mean no. adults

Treatments	Rate/a	6-18-04	6-28-04	7-07.04	Mean
Proclaim	1.56 gm	9.50a	8.75b	10.25b	4.33b
Proclaim	2.35 gm	3.25a	5.50b	7.50b	3.64b
Spintor	7.0 oz	0.25b	0.50a	0.25c	1.00c
Control		9.75a	14.25a	17.00a	6.39a

Means within a column followed by the same letter do not differ significantly ($P > 0.05$; DMRT).

Mean numbers of *T. palmi* larvae/5 leaf sample of cucumber

Mean number larvae

Treatments	Rate/a	6-18-04	6-28-04	7-07.04	Mean
Proclaim	1.56 gm	16.50b	17.00b	23.00c	18.83b
Proclaim	2.35 gm	11.25b	11.50b	17.00c	13.25b
Spintor	7.0 oz	0.50c	0.50a	0.75d	0.92c
Control		44.50a	39.25a	39.00a	40.92a

Means within a column followed by the same letter do not differ significantly ($P > 0.05$; DMRT).

Summary of Study 1

- **Proclaim significantly reduced *T. palmi* when compared with the nontreated control**
- **Spintor provided satisfactory reduction of *T. palmi***

Study 2

- **Crop: 'Pod Squad' Bean**
- **Date of Planting: 12 Jan, 2004**
- **Plot: 2 rows, each 30 feet long**
- **Plot design: RCB with four replications.**

Treatments	Rate/a
HM 88	0.5% v/v
SpinTor	4.0 oz
SpinTor	7.0 oz
SpinTor + HM 88	4.0 oz 0.5% v/v
SpinTor + HM 88	7.0 oz 0.5% v/v
Control	

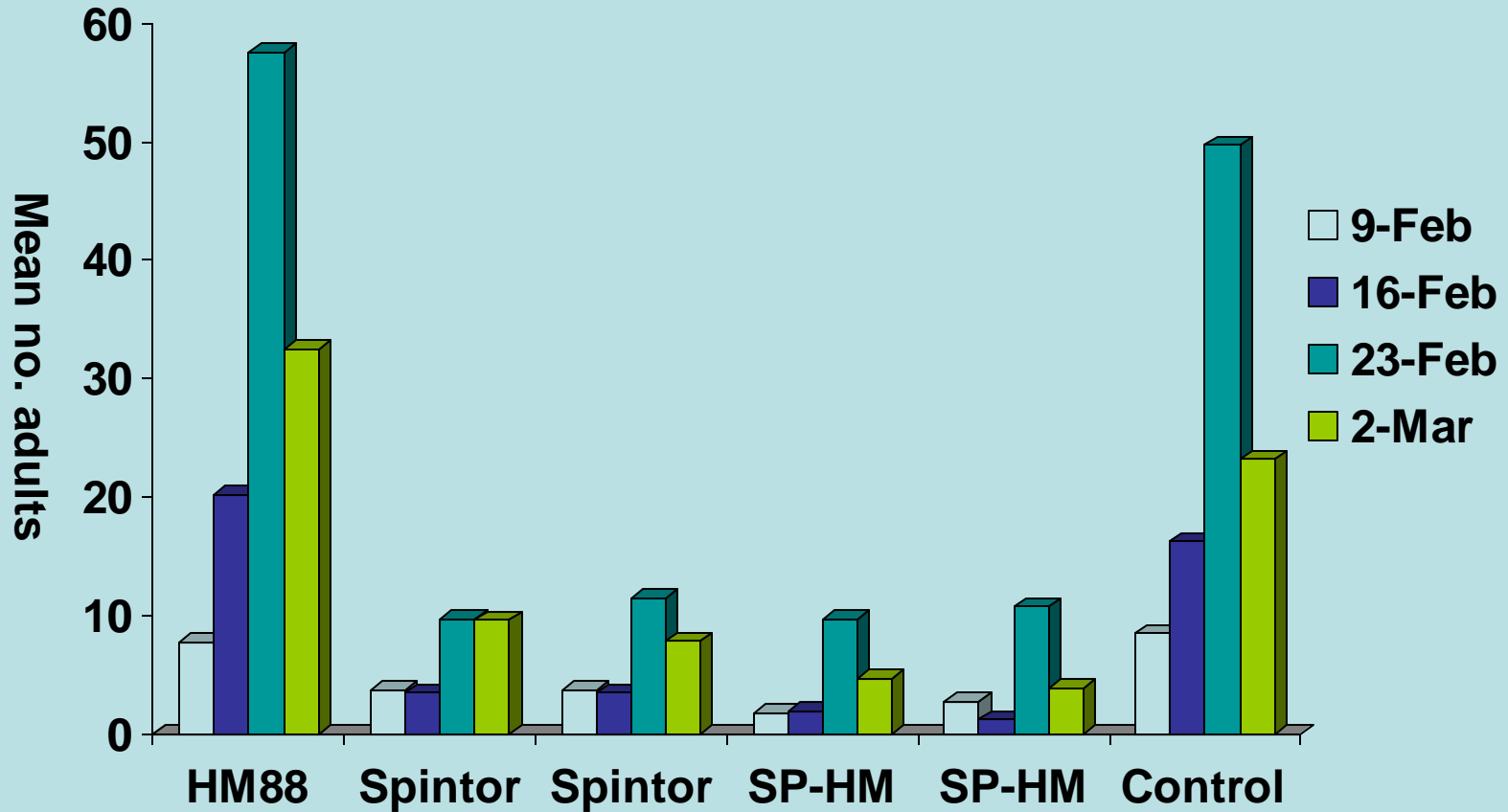
Application method

- **Date of application: 8, 15 and 23 Feb. and 2 March, 2004**
- **Method of application: Backpack sprayer with one nozzle**
- **Pressure: 30 PSI**
- **Volume: 70 GPA**

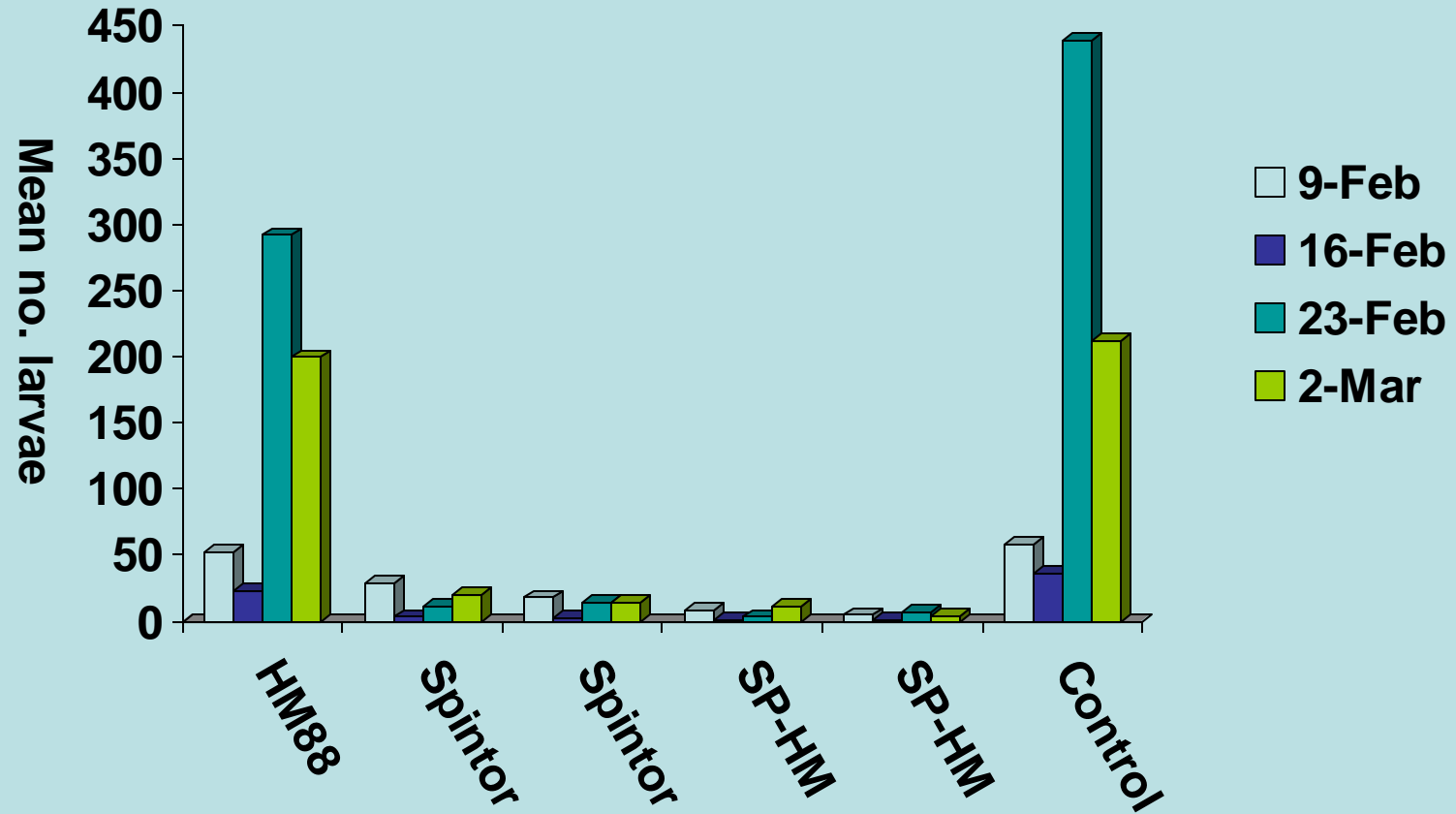
Sampling method

- **Samples were collected 24 h after each application.**
- **Sample size: 20 leaves, one leaf/plant**
- **Collection of thrips: leaves were washed with 70% alcohol to separate thrips.**

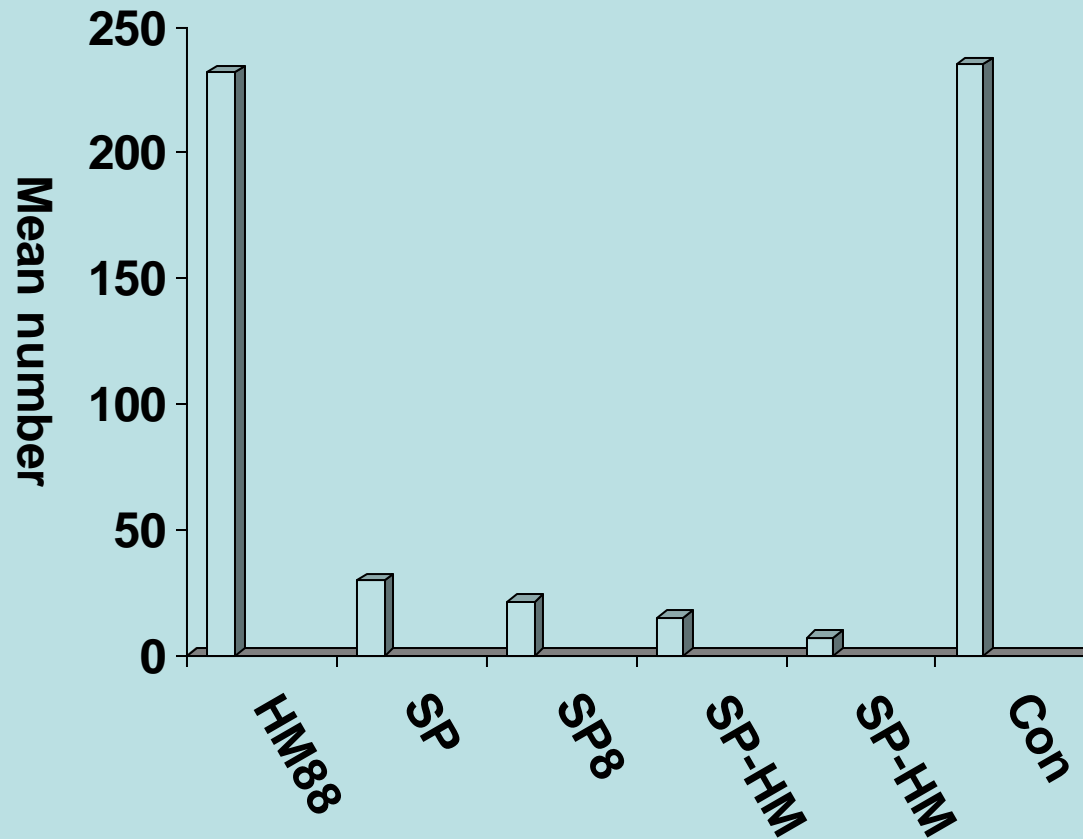
Mean numbers of *T. palmi* adults per 20-leaf sample



Mean numbers of *T. palmi* larvae per 20-leaf sample



Mean numbers of *T. palmi* per 20-leaf sample



Summary of Study 2

- **Spintor significantly reduced *T. palmi* when compared with the nontreated control**
- **HM88 alone did not differ from the nontreated control**
- **Spintor in combination with HM88 provided improved control of *T. palmi***

Study 3

- **Crop: `Pod Squad' Bean**
- **Date of Planting: 10 Feb, 2004**
- **Plot: 2 rows, each 30 feet long**
- **Plot design: RCB with four replications.**

Treatments

Treatments	Common name	Rate/acre
Knack	pyriproxyfen	8 oz.
Danitol	Fenpropathrin	16 oz
Danitol		21 oz
Knack + Orthene	Pyriprosyfen + Acephate	8 oz + 12 oz
Danitol + Orthene		10.75 oz + 12 oz
Knack + Danitol+ Orthene	Rate/acre	8 oz + 10.75 oz + 12 oz
Control		

Application method

- **Date of application: 1, 8, 15, 22 March, 2004**
- **Method of application: Backpack sprayer with one nozzle**
- **Pressure: 30 PSI**
- **Volume: 70 GPA**

Sampling method

- **Samples were collected 24 h after each application.**
- **Sample size: 10 leaves, one leaf/plant**
- **Collection of thrips: leaves were washed with 70% alcohol to separate thrips.**

Mean numbers of *T. palmi* adults/sample

Treatments	Rate/acre	Mean no. adults
Knack	8 oz.	12.31ab
Danitol	16 oz	10.75b
Danitol	21 oz	10.12b
Knack + Orthene	8 oz + 12 oz	11.50b
Danitol + Orthene	10.75 oz + 12 oz	11.44b
Knack + Danitol+ Orthene	8 oz + 10.75 oz + 12 oz	9.20b
Control		16.56a

Mean numbers of *T. palmi* larvae/sample

Treatments	Rate/acre	Mean no. larvae
Knack	8 oz.	69.37ab
Danitol	16 oz	62.31a-c
Danitol	21 oz	52.00b-d
Knack + Orthene	8 oz + 12 oz	45.31cd
Danitol + Orthene	10.75 oz + 12 oz	42.50cd
Knack + Danitol+ Orthene	8 oz + 10.75 oz + 12 oz	36.62d
Control		82.93a

Summary of Study 3

- **All treatments provided significant reduction of *T. palmi* when compared with the nontreated dcontrol**

Study 4

- **Crop: `Jalapeno' pepper**
- **Date of Planting: 25 Feb., 2005**
- **Plot: 2 rows, each 30 feet long**
- **Plot design: RCB with four replications.**

Treatments

Treatments	Rate [oz]/acre
BAS 320 + Penetrator Plus	11.4 + 0.5% v/v
BAS 320 + Penetrator Plus	16.0 + 0.5% v/v
Asana XL	9.7
BAS 320 +PP + Asana XL	9.14+ 0.5% v/v + 9,7
BAS 320 +PP + Asana XL	11.4+ 0.5% v/v + 9.7
Nontreated check	

Application method

- **Date of application: 10, 18, 25 April and 5 May 2005**
- **Method of application: Backpack sprayer with one nozzle**
- **Pressure: 30 PSI**
- **Volume: 100 GPA**

Sampling method

- **Samples were collected 24 h after each application.**
- **Sample size: 20 leaves, one leaf/plant**
- **Collection of thrips: leaves were washed with 70% alcohol to separate thrips.**

Mean numbers of *T. palmi* adults per 20-leaf sample of pepper

Mean no. adults

Treatments	Rate [oz]/acre	25 April	5 May
BAS 320 + Penetrator Plus	11.4 + 0.5% v/v	13.00b	8.00c
BAS 320 + Penetrator Plus	16.0 + 0.5% v/v	16.00b	5.50c
Asana XL	9.7	39.00a	43.00a
BAS 320 +PP + Asana XL	9.14+ 0.5% v/v + 9.7	37.50a	19.25b
BAS 320 +PP + Asana XL	11.4+ 0.5% v/v + 9.7	48.25a	27.25b
Nontreated check		15.00b	5.25c

Mean numbers of *T. palmi* larvae per 20-leaf sample of pepper

Mean no. *T. palmi* larvae

Treatments	Rate [oz]/acre	25 April	5 May
BAS 320 + Penetrator Plus	11.4 + 0.5% v/v	4.25b	7.50b
BAS 320 + Penetrator Plus	16.0 + 0.5% v/v	7.50b	6.50b
Asana XL	9.7	70.50a	60.50a
BAS 320 +PP + Asana XL	9.14+ 0.5% v/v + 9.7	57.25a	51.75a
BAS 320 +PP + Asana XL	11.4+ 0.5% v/v + 9.7	71.25a	51.25a
Nontreated check		65.25a	77.25a

Summary of Study 4

- **BAS 320 in combination with Penetrator Plus provided significant control of *T. palmi*.**
- **Asana alone or in combination with BAS 320 did not differ from nontreated control in controlling *T. palmi*.**

Study 5

- **Crop: `Black Beauty' Eggplant**
- **Date of Planting: 12 Dec., 2005**
- **Plot: 2 rows, each 30 feet long**
- **Plot design: RCB with four replications.**

Treatments

Treatments	Rate [oz]/acre
Spintor	8.0 oz
XDE	7.0
XDE	5.0
XDE	3.0
XDE	2.0
Novaluron	12.0
Spintor-Novaluron	8 – 12
Control	

Application method

- **Date of application: 6, 10, 17, 24 Feb., 2, 15, 22 and 29 March, 2005**
- **Method of application: Backpack sprayer with one nozzle**
- **Pressure: 30 PSI**
- **Volume: 100 GPA**

Sampling method

- **Samples were collected 24 h after each application.**
- **Sample size: 5 leaves, one leaf/plant**
- **Collection of thrips: leaves were washed with 70% alcohol to separate thrips.**

Mean numbers of *T. palmi* adults and larvae/5-leaf sample of eggplants

Treatments	Rate [oz]/acre	Adults	Larvae
Spintor	8.0 oz	2.65c	1.48c
XDE	7.0	2.47c	0.98c
XDE	5.0	1.98c	0.73c
XDE	3.0	5.25c	0.90c
XDE	2.0	3.51c	1.93c
Novaluron	12.0	15.00ab	6.85b
Spintor-Novaluron	8 – 12	20.30b	2.93c
Control		17.93a	15.41a

Summary of Study 4

- **XDE is more effective than Spintor in controlling *T. palmi*.**