

The current status of *Tuta absoluta* in Iran

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(tomato leafminer)

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Geographic distribution:

This moth is native to **Peru** and probably it is widespread in **all countries in South America**.

Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela.



In 2004, when the tomato leaf miner *Tuta absoluta* (Povolny, 1994) was alien for Europe it was categorized by EPPO in A1 action list as no. 321 (OEPP/EPPO Bulletin, 2005) as recommended for regulation as quarantine pest. The first record in Europe is from the end of 2006 on tomatoes in the province Castellón (Comunidad Valenciana) in Spain (FERA, 2009). In less than three years the pest has been recorded in Portugal, Italy, France, Malta, Switzerland, Greece, Albania, as in some countries in the Mediterranean region -

Geographic distribution:

Asia: Japan, Bahrain , Kuwait, Palestine , Syria, Jordan, Saudi Arabia,Iraq &Iran.

Africa: Morocco, Algeria, Tunisia, Libya, Egypt.

Europe:Italy, France, Malta, United Kingdom, Greece, Switzerland, Portugal, Albania, Netherlands, Turkey, Israel, Austria, Belgium, Bulgaria , Czechoslovakia, Cyprus, Denmark, Estonia, Finland, Germany, Hungary, Ireland, Croatia, Latvia, Lithuania, Luxembourg, Norway, Poland, Romania, Russian Federation, Slovakia, Sweden.

South America: Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay ,Peru, Uruguay, Venezuela.



Geographic distribution: 2011

Hosts:

Major hosts:

Lycopersicon esculentum (tomato)



Minor hosts:

Solanum tuberosum (potato)



Wild hosts:

Datura stramonium (jimsonweed),
Nicotiana glauca (Tree tobacco),
Solanum nigrum (black nightshade)



The main producing countries of tomato

This is a list of countries by tomato production in 2008 mostly based on FAOSTAT [FAO](#) accessed in August 2010.
















>1,000,000 tonnes

Rank	Country/Region	Tomato production (tonnes)
1	 People's Republic of China	33,911,702
2	 United States	13,718,171
3	 Turkey	10,985,355
4	 India	10,303,000
5	 Egypt	9,204,097
6	 Italy	5,976,912
7	 Iran	4,826,396
8	 Spain	3,922,500
9	 Brazil	3,867,655
10	 Mexico	2,936,773
11	 Russia	1,938,710
12	 Uzbekistan	1,930,000
13	 Nigeria	1,701,000
14	 Ukraine	1,492,100
15	 Greece	1,338,600
16	 Morocco	1,312,310
17	 Chile	1,270,000
18	 Tunisia	1,170,000
19	 Syria	1,163,300
20	 Portugal	1,147,600

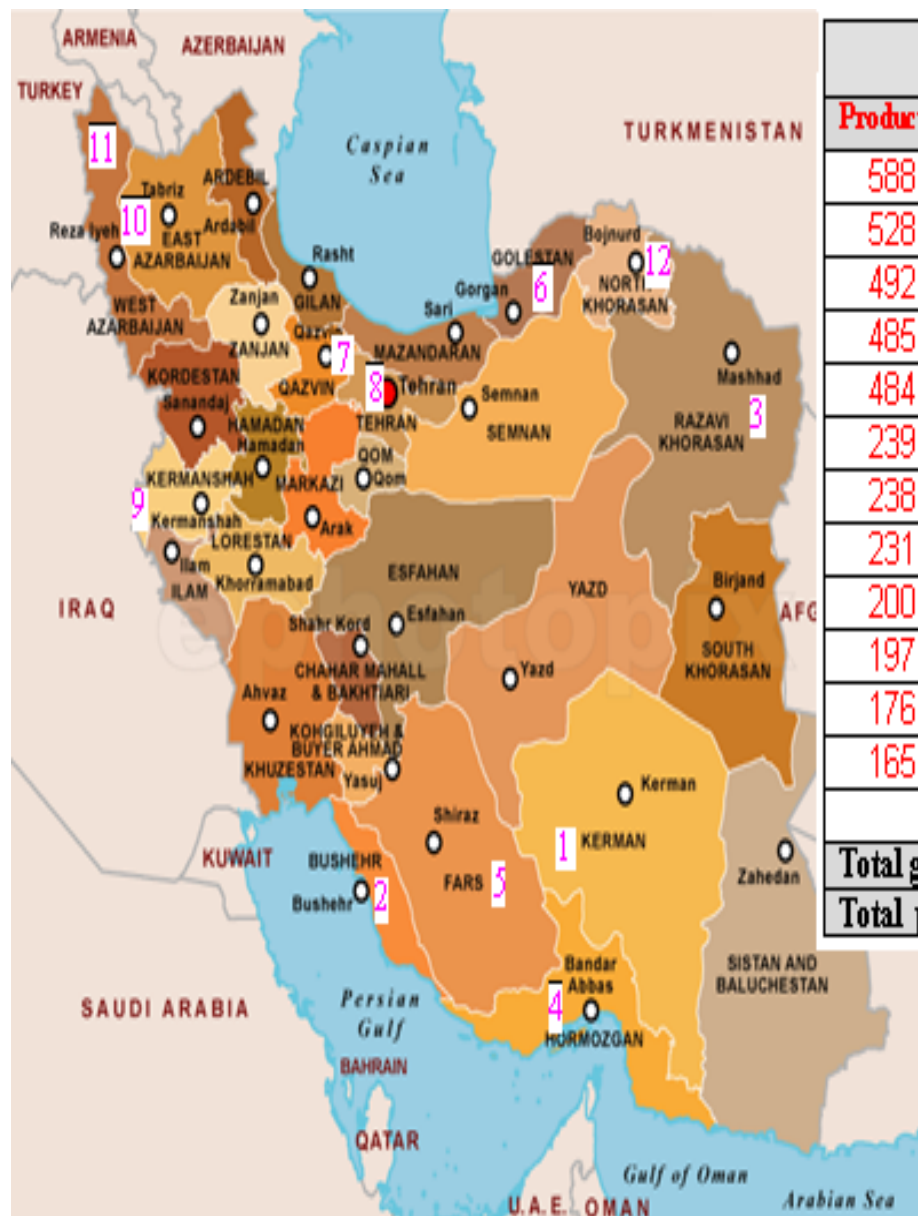
100,000–1,000,000 tonnes

Rank	Country/Region	Tomato production (tonnes)
20	 Iraq	830,000
21	 Romania	814,376
22	 Algeria	800,000
23	 Canada	770,059
24	 Japan	750,300
25	 Netherlands	720,000
26	 France	714,635
27	 Poland	702,546
28	 Argentina	680,000
29	 Indonesia	624,420
30	 Jordan	600,336
31	 Cuba	575,900
32	 Kenya	559,680
33	 Kazakhstan	549,310
34	 Pakistan	536,217
35	 Colombia	490,929
36	 Saudi Arabia	477,572
37	 Azerbaijan	438,419
38	 Sudan	432,000
39	 South Africa	420,701
40	 Israel	420,524
41	 Cameroon	420,000
42	South Korea	408,170

Some countries in our reign is infected with *Tuta absoluta*

2003	Use total (1000 ton)	Use One kg/ one/year	سال ۲۰۰۲	کل مصرف (هزار تن)	مصرف به ازای هر یک متر (Kg/نتر/سال)
Turkey	6,112	85	 ترکیه	۶,۱۱۲	۸۵
Egypt	6,070	84	 مصر	۶,۰۷۰	۸۴
Italy	3,797	66	 ایتالیا	۳,۷۹۷	۶۶
Iran	3,394	49	 ایران	۳,۳۹۴	۴۹
Brazil	3,305	18	 برزیل	۳,۳۰۵	۱۸
Russia	2,540	17	 روسیه	۲,۵۴۰	۱۷
Spain	1,753	42	 اسپانیا	۱,۷۵۳	۴۲
France	1,556	25	 فرانسه	۱,۵۵۶	۲۵
England	1,347	22	 انگلستان	۱,۳۴۷	۲۲
Greece	1,268	115	 یونان	۱,۲۶۸	۱۱۵
Mexico	1,253	12	 مکزیک	۱,۲۵۳	۱۲
Germany	1,226	14	 آلمان	۱,۲۲۶	۱۴
Ukraine	1,170	24	 اوکراین	۱,۱۷۰	۲۴
Uzbekistan	1,096	42	 ازبکستان	۱,۰۹۶	۴۲
Japan	1,066	8	 ژاپن	۱,۰۶۶	۸

Per capita consumption of tomatoes per person per year



12 province maximum growing area			
Production (tn)	Growing (he)	province	no
588000	16800	Jerof	1
528500	15100	Busher	2
492135	14061	Khorasan razawe	3
485310	13866	Hormozgan	4
484680	13848	Fars	5
239015	6829	Golestan	6
238000	6800	Gazwen	7
231875	6625	Tehran	8
200095	5717	Kermanshah	9
197750	5650	Azarbaijan sharghe	10
176470	5042	Azarbaijan gharbe	11
165725	4735	Khorasan shomale	12
Total growing tomato in Iran		148017 he.	
Total production tomato in Iran		5180000 ton	

Provinces 12 The cultivation and production tomato in Iran & with the highest levels of cultivation and production

Introduction

Outlines of tomato production

- Iran Tomato production is 151,610 ha and 7 producer in the world
- Total production is 5 m ton
- There are 140 Factories Paste for local consumption and export
- Tomato fresh consumption is 50 Kg Per capita.



Current status measures in monitoring and controlling tomato pests in Iran, 2010.

151,610	ha	for insect
122,323	ha	for diseases
74,435	ha	for weeds
128,279	ha	for surveillance & forecasting Network

EPPO Reporting Service

No. 1 PARIS, 2008-01-01

CONTENTS _____

Pests & Diseases

2008/001 - First report of Tuta absoluta in Spain

EPPO Reporting Service

No. 1 PARIS, 2009-01-01

CONTENTS _____

Pests & Diseases

2009/003 - First report of Tuta absoluta in France

EPPO Reporting Service

No. 2 PARIS, 2009-02-01

CONTENTS _____

Pests & Diseases

2009/023 - First record of Tuta absoluta in Italy

2009/024 - Tuta absoluta caught in a tomato packing station in the Netherlands

EPPO Reporting Service

No. 8 PARIS, 2010-08-01

CONTENTS

2010/138 - First report of *Tuta absoluta* in Guernsey

EPPO Reporting Service

No. 11 PARIS, 2010-11-01

CONTENTS

2010/208 - First record of *Tuta absoluta* in Turkey

EPPO Reporting Service

No. 4 PARIS, 2011-04-01

CONTENTS

Pests & Diseases

2011/071 - First report of *Tuta absoluta* in Greece

2011/072 - First report of *Tuta absoluta* in Lithuania

2011/073 - First report of *Tuta absoluta* in Iraq

2011/074 - *Tuta absoluta* detected in Trentino-Alto Adige region(IT)

2011/075 - *Tuta absoluta* in the United Kingdom

2011/076 - *Tuta absoluta* continues to spread around the Mediterranean Basin

Collection and Identification

Monitoring program

The Iranian PPO and inspection service in IRIPP prepared a monitoring program for this pest during 2009 - 2011.

A technical guideline was issued and distributed among PPO inspectors. Since June 2010, PPO technicians have regularly monitored the pest in the tomato growing area.

For the first time in November 2010, some tomato samples collected by Javadi- emamzadeh (Uromiyeh PPO) on tomato from Uromiyeh in Azarbaijan province in north west country, near Turkey boarder.

These samples identified as *Tuta absoluta* by Alipana from IRIPP.

More pheromone traps placed to covering the entire area of growing tomato throughout the country.

Detection and inspection:

- Tomato Fruit inspection



Detection and inspection:

- field inspection

the apical buds, flowers or new fruits, where the **black frass is visible**.
When there is a severe attack it colonizes the leaves on the other parts
of the plant. **Mines** are evident on attacked leaves



Detection and inspection:

-Pheromone traps

Pheromone traps give early warning of infestation and also exhibits the density of the insect accurately in low population to medium level infestation.



Result of monitoring

October 2010



Result of Detection



February 2011



Result of Detection



March 2011

Result of Detection



April 2011



Result of Detection



July 2011



Result of Detection



Augst 2011



Result of Detection



September 2011



Result of Detection



October 2011



Result of Detection



November 2011



- October 2010
- February 2011
- March 2011
- April 2011
- July 2011
- August 2011
- Sep. 2011
- October 2011
- November 2011



Result of Detection until November 2011

Collection and Identification

Monitoring program

latest detection result at the end of November 2011 are as follows:

October 2010, west Azarbaijan province.

February 2011, Bushehr province.

March 2011, Kordestan & Eilam provinces.

April 2011, Kermanshah & khuzestan provinces.

July 2011, Fars province.

August 2011, east Azarbaijan, Ardabil, Isfahan, Lorestan provinces.

September 2011, Tehran, Qazvine, Hamedan, Markazi ,
,kohqeuleh&buyerAhmad, Charmahal bakhtiari provinces.

October 2011, Zanjan, Semnan, Kerman, Yazd, North Khorasan, provinces.

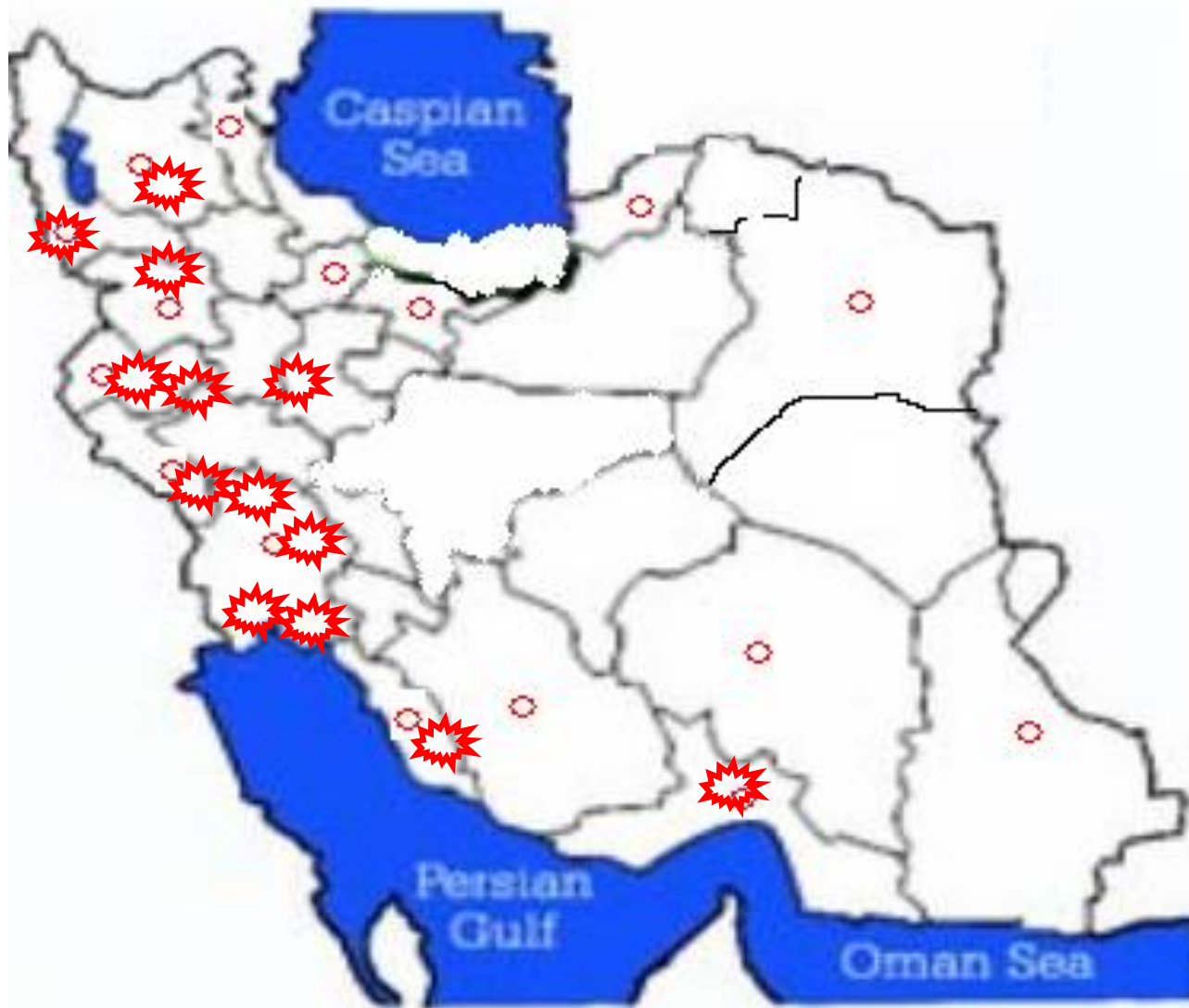
November 2011, Hormozgan, Sistan&Baluchestan provinces.

In total 24 provinces are infested in Iran which covered most tomato growing area

Economic impact:

- *T. absoluta* has been caused 50-100% losses in tomato, both in protected and open fields which is happened in Iran mostly in the west of the country.





Critical growing area infested with *T. absoluta* at end of October 2011

Symptoms:



Damage on Fruit tomato in **Kermansha**

Symptoms:



Damage on Fruit tomato in **Kermansha**

Symptoms:



Damage on Fruit tomato in **Kermansha**



Damage on Fruit tomato in Ghasr e shirin (Kermansha province)



Damage on Fruit tomato in Azarbaijan province)

Means of movement and dispersal of *Tuta absoluta*:

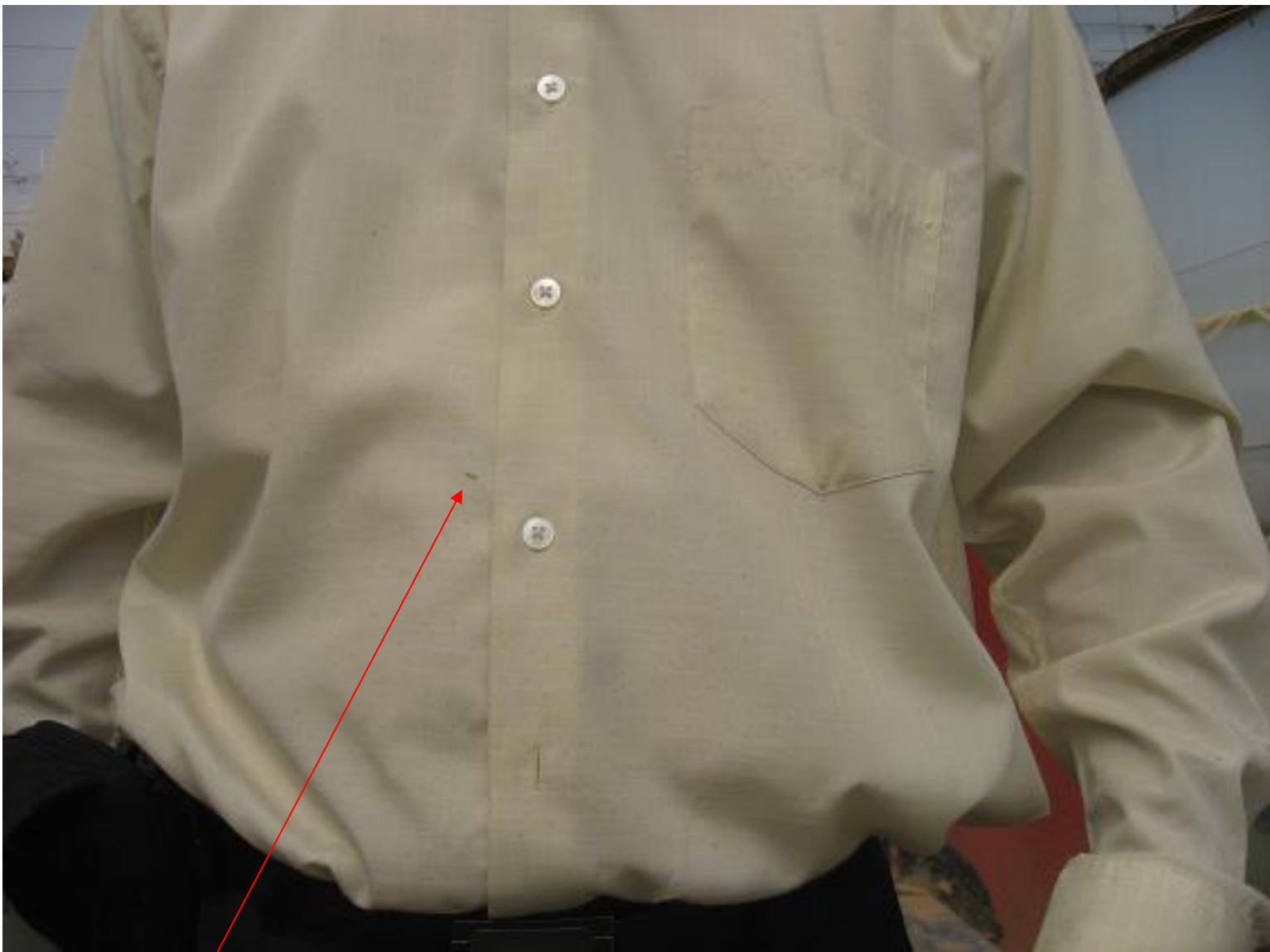


Tomato Nursery at KVK Farm - Variety ABHINAV

Means of movement and dispersal:

- **Fruits** (inc. Pods): Eggs, Larvae; borne internally; visible to naked eye

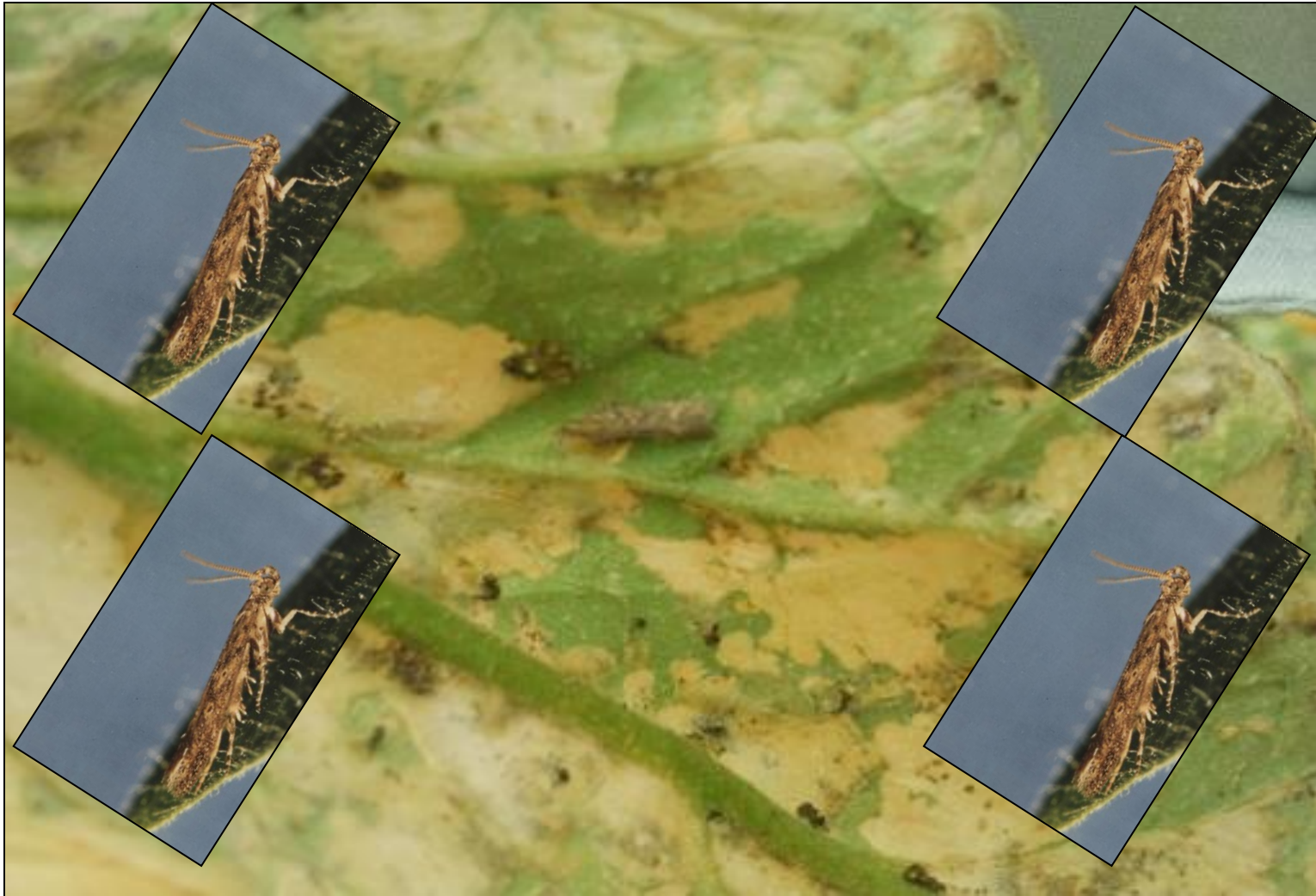




Means of movement and dispersal

move of larvae on shirt between the field

Direct fly of Adult



Adult of *Tuta absoluta* in Kermansha

Control strategies

Based on experiences in other countries the following tools and materials are available to control *T. absoluta* in Iran.

Mass Trapping

Mass trapping is a technique with a higher number of traps in the crop field using pheromone and light traps

Biological control

About 60 natural enemies against *T. absoluta* was reported from word wild . The following bio-agents are available to control *Tuta absoluta* in Iran

Trichogramma achaeae , *Nesidiocoris tenuis*, *Macrolophus caliginosus*
Podisus nigrispinus and microbial agents: *Bacillus thuringiensis* var. *kurstaki*
Metarhizium anisopliae and *Beauveria bassiana*

Parasitoids , parasite and predators



Nesidiocoris tenuis

Macrolophus caliginosus

Podisus nigrispinus



Metarhizium anisopliae

Beauveria bassiana

Control strategies

Botanical Insecticides

Neem seed extract, Azadirachtin acts as contact against *Tuta absoluta*. There is two types of Neem formulation in Iran.

Chemical control

Chemical control has been the main control measure used against *Tuta absoluta* . two chemical insecticides are registered and available in Iran ,

1. Spinosad 200 – 250 ml/ha SC 240
2. Indoxacarb 200 – 250 ml/ ha SC

A field trial to comparison of two tomato fields with action and no action against Tuta absoluta

Date : July. 2011



Farmer 2



Farmer 1



continue field 1...

Date : July. 2011



continue field 2 ...

Date : July. 2011



Use of Optical trap& Mass trapping with Pheromone

field 1



Use of Optical trap& Mass trapping with Pheromone

Field 1

Date of inspection August 14 2011



Don't Use of Optical trap& Mass trapping with Pheromone

field 2

Date of inspection August 14 .2011



CONCLUSION

This pest is observed for the first time on October 2010 in Azarbaijan in neighboring of Turkey boarder, so Apparently, *T. absoluta* entered to Iran from border of Turkey or Iraq .

According the latest survey 24 provinces are infested until November 11 , 2011.

A high infested tomato crops observed in 3 provinces, kermanshah, Azarbaijan and Hormozgan

we keep the monitoring program through the country using the pheromone traps.

Suggestions

According the latest survey 24 provinces are infested until November 11 , 2011. we need FAO with TCP project help us for control this pest

IN some area we have high infestation of pest optical trap is very useful o?



IN some area we have about 50 adult in the week but we didn't see any damage ,we need to be know why? and what we have to do?

Question for symposium

According the latest survey 24 provinces are infested until November 11 , 2011. we have more than 50 adult per week, but we didn't see any damage ,we need to be know why? and what we have to do in this condition?



