

State of Israel



Ministry of Agriculture and Rural Development

Plant Protection and Inspection Services

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Treatment Manual

Complies with: Plant Protection Regulations (Plant Import,
Plant Products, Pests and Regulated Products) – 2009

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Version 2

Table of Contents:

Introduction and Definitions	3
Fumigation Treatments	4
Methyl Bromide Fumigation	4
Phosphine Fumigation	8
Heat Treatments	14
Immersion Treatments	18
Irradiation Treatments	21

Introduction and Definitions

Treatment Manual: A manual that specifies the procedures for handling consignments, as may be revised periodically by the director, and is deposited in the Ministry of Agriculture's library for public reference.

Treatment: An action taken according to one of the methods mentioned in Annex 1 of the Plant Protection Regulations (Plant Import, Plant Products, Pests) – 2009 to prevent the introduction of pests to Israel.

Quarantine Pest: Any pest listed in Annex 2 (Plant Protection Regulations of 2009) or any pest that is not present in Israel or not established therein, or that is present in limited distribution and is under official control.

The Treatment Manual incorporates guidelines for various types of treatment approved by the Plant Protection and Inspection Services for use on imported consignments.

When there is a requirement (according to an import license, the regulations, or a Plant Protection inspector's guidelines) to treat a consignment, the treatment will be carried out in accordance with the instructions in this manual.

Treating a consignment will be approved only if the consignment's packaging enables penetration and distribution of the active substance in a manner that will afford effective treatment.

Some of the treatments will be carried out only in facilities that were examined and approved by a Plant Protection and Inspection Services inspector prior to the treatment. Information regarding the necessity of prior approval for the treatment facility can be found in the notes for the specific treatment in this manual.

Quarantine treatment by methyl bromide fumigation may be performed only by extermination companies that were authorized or recognized by the Plant Protection and Inspection Services and that have certificates of recognition or authorization that are valid at the time of the treatment. A list of extermination companies that have been recognized or authorized can be found on our website at: <http://www.ppis.moag.gov.il/ppis>.

Defining treatments in the regulations gives the treatment manual its validity.

1. Fumigation Treatments

1.1 Methyl Bromide Fumigation

The Product: Cashew, pistachio, hazelnut, chestnut, walnut, almond
Anacardium occidentale, *Pistacia vera* L., *Crylus* L., *Castanea sativa* Mill., *Juglans regia* L.,
Prunus dulcis (Mill) Webb

Form of Product: Inshell nuts for consumption

Treatment Target: Various insects

Treatment: Fumigation (methyl bromide)

Temperature (degrees Celsius)	Concentration (g/m3)	Treatment Duration (hours)
25+	16	24
21-24	24	24
15-20	32	24
10-14	40	24

Notes: If the temperature is below 10 degrees Celsius, it is not possible to fumigate with methyl bromide.

Alternative treatments can be used for this product: Phosphine treatment as written in this manual.

The Product: Groundnuts (peanuts) – *Arachis hypogaea* L.

Form of Product: Shelled nuts for industry

Treatment Target: Various insects

Treatment: Fumigation (methyl bromide)

Temperature (degrees Celsius)	Concentration (g/m3)	Treatment Duration (hours)
21+	24	24
15-20	32	24
10-14	40	24

Notes: If the temperature is below 10 degrees Celsius it is not possible to fumigate with methyl bromide. Blanched shelled nuts for industry will undergo heat treatment during the blanching process according to the heat treatment section of this manual.

Alternative treatments can be used for this product: Phosphine treatment as written in this manual.

The Product: Wood with or without bark
Form of Product: (Timbers, logs and trunks)

Treatment Target: Various insects
Treatment: Fumigation (methyl bromide)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
20+	80	24

Notes: For logs with a diameter of less than 50 mm, the treatment duration can be shortened to 8 hours.
 Alternative treatments can be used for this product: Phosphine or heat treatment as written in this manual.

The Product: Sunflower – *Helianthus annuus*
Form of Product: Inshell seeds for consumption

Treatment Target: Various insects
Treatment: Fumigation (methyl bromide)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
10+	32	24

An alternative treatment can be used for this product: Phosphine treatment as written in this manual.

The Product: Bamboo, straw and rattan products
Form of Product: Canes and branches

Treatment Target: Various insects
Treatment: Fumigation (methyl bromide)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
21+	48	24
16-20	56	24
10-15	64	24

Notes:

The Product: Wood packing material and wooden pallets
Form of Product: Wood packing material and wooden pallets

Treatment Target: Various insects
Treatment: Fumigation (methyl bromide)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
21+	48	24
16+	56	24
11+	64	24

Notes: This treatment is required by International Standard No. 15.
An alternative treatment can be used for this product: It can undergo heat treatment as written in this manual.

The Product: Cotton fibers
Form of Product:

Treatment Target: Insects
Treatment: Fumigation (methyl bromide)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15.5+	48	24

Notes: Insects external to the compressed packages.
An alternative treatment can be used for this product: Phosphine treatment as written in this manual.

The Product: Dried cut flowers and branches
Form of Product: Dried

Treatment Target: Various insects
Treatment: Fumigation (methyl bromide)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
21+	48	24
15-20	56	24

Notes:

The Product: Dried coconut without the husk – *Cocus sp.*

Form of Product: Fresh fruit for consumption

Treatment Target: External pests

Treatment: Fumigation (methyl bromide)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
20+	32	24

Notes:

The Product: Wood bark

Form of Product: Bark

Treatment Target: Various insects

Treatment: Fumigation (methyl bromide)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
21+	48	24
10-20	80	24

An alternative treatment can be used for this product: It can undergo heat treatment as written in this manual.

The Product: Broomcorn – *Sorghum vulgare var. technicum*

Form of Product:

Treatment Target: Various insects

Treatment: Fumigation (methyl bromide)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	40	24

Notes:

The Product: Woodchips

Form of Product:

Treatment Target: Various insects

Treatment: Fumigation (methyl bromide)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
21+	48	24
10-20	80	24

Notes:

1.2 Phosphine fumigation

The Product: *Leucospermum*

Form of Product: Seeds for propagation

Treatment Target: Various insects

Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: Groundnuts (peanuts) – *Arachis hypogaea* L.

Form of Product: Shelled nuts for industry

Treatment Target: Various insects

Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
20+	3	144

Notes: Blanched shelled nuts for industry will undergo heat treatment during the blanching process according to the heat treatment section of this manual.

Notes: An alternative treatment can be used for this product: Methyl bromide treatment as written in this manual.

The Product: Cashew, pistachio, hazelnut, chestnut, walnut, almond

Anacardium occidentale, *Pistacia vera* L., *Crylus* L., *Castanea sativa* Mill., *Juglans regia* L.,

Prunus dulcis (Mill) Webb

Form of Product: Inshell nuts for consumption

Treatment Target: Various insects

Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	1	168

Notes: An alternative treatment can be used for this product: Methyl bromide treatment as written in this manual.

The Product: Maple – *Acer*
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: Oak – *Quercus*
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: Pea – *Pisum L.*
Form of Product: Seeds for propagation

Treatment Target: Various insects and fungus

The treatment will be one of the following treatments:

1. Fumigation (phosphine) + immersion in (Carboxin 200 g/l + Thiram 200 g/l) in a concentration of 3 liters/ton
2. Fumigation (phosphine) + Carbendazim 0.03% + Thiram 2 grs/kg
3. Fumigation (phosphine) + Wakil XL (Metalaxyl-M; penetrative fludioxonil and translaminar cymoxanil)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment's duration (hours)</i>
15+	2	96

Notes:

The Product: Peach – *Prunus persica L.*
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: *Leucadendron*
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment's duration (hours)</i>
15+	2	96

Notes:

The Product: *Araucaria Juss*
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: Wood with or without bark
Form of Product: Timber, logs and trunks

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15.5+	5	96

Notes: Alternative treatments can be used for this product: Methyl bromide or heat treatment as written in this manual.

The Product: Cherry – *Prunus avium* L.
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: Sunflower – *Helianthus annuus*
Form of Product: Seeds for propagation and inshell seeds for consumption

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes: An alternative treatment can be used for this product: Methyl bromide treatment as written in this manual for inshell seeds for consumption.

The Product: Apricot – *Prunus armeniaca* L.
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: Cotton fibers
Form of Product:

Treatment Target: Insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes: Insects external to the compressed packages.
An alternative treatment can be used for this product: Methyl bromide treatment as written in this manual.

The Product: Juniper – *Juniperus*
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: *Protea*
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: Broad bean – *Vicia faba* L.
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: *Poulownia*
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: *Cycas*
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: *Castanospermum Cunn.*
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: Plum – *Prunus domestica* L.
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

The Product: Almond – *Prunus dulcia* (Mill).
Form of Product: Seeds for propagation

Treatment Target: Various insects
Treatment: Fumigation (phosphine)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (hours)</i>
15+	2	96

Notes:

2. Heat Treatments

2.1 Dry Heat Oven

The Product: Groundnuts (peanuts) – *Arachis hypogaea* L.

Form of Product: Shelled nuts for industry

Treatment Target: Various insects

Treatment: Dry heat oven

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (minutes)</i>
60	-	45

Notes: This treatment is performed during the peanut blanching stage, and is in addition to the methyl bromide or phosphine treatment as written in this manual.

The Product: Wood with and without bark

Form of Product: Timber, logs and trunks

Treatment Target: Various insects

Treatment: Dry heat oven

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (minutes)</i>
60	-	45

Notes: If the treatment is performed in Israel, it can be carried out only at heat facilities approved by the Plant Protection and Inspection Services.
Alternative treatments can be used for this product: Methyl bromide or phosphine as written in this manual.

The Product: Wood packing material and wooden pallets

Form of Product: Wood packing material and wooden pallets

Treatment Target: Various insects

Treatment: Dry heat oven

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (minutes)</i>
56	-	30

Notes: This treatment is required by International Standard No. 15
If the treatment is performed in Israel, it can be carried out only at heat facilities approved by the Plant Protection and Inspection Services.
An alternative treatment can be used for this product: Methyl bromide treatment as written in this manual.

The Product: Wood bark
Form of Product: Barks

Treatment Target: Various insects and nematodes
Treatment: Steam heat oven

<i>Temperature (degrees Celsius)</i>	<i>Concentration (g/m3)</i>	<i>Treatment Duration (minutes)</i>
60+	-	40

Notes: An alternative treatment can be used for this product: Methyl bromide treatment as written in this manual.

2.2 Immersion in Hot Water

The Product: *Amaryllis*
Form of Product: Bulbs for propagation

Treatment Target: Onion fly
Treatment: Hot water immersion

<i>Temperature (degrees Celsius)</i>	<i>Concentration (-)</i>	<i>Treatment Duration (minutes)</i>
43.5	-	120

Notes:

The Product: Cruciferous vegetables – *Brassica sp.*
Form of Product: Seeds for propagation

Treatment Target: Bacteria
Treatment: Hot water immersion

<i>Temperature (degrees Celsius)</i>	<i>Concentration (-)</i>	<i>Treatment Duration (minutes)</i>
See notes	-	

Notes: The import requirements for this product were updated and this treatment is no longer required.

The Product: Dahlia
Form of Product: Bulbs for propagation

Treatment Target: Nematodes
Treatment: Hot water immersion

<i>Temperature (degrees Celsius)</i>	<i>Concentration (-)</i>	<i>Treatment Duration (minutes)</i>
47.8	-	30

Notes:

The Product: Ginger – *Zingiber officinale*
Form of Product: Fresh vegetables for consumption

Treatment Target: Nematodes
Treatment: Hot water immersion or steam treatment

<i>Temperature (degrees Celsius)</i>	<i>Concentration (-)</i>	<i>Treatment Duration (minutes)</i>
48	-	30

Notes:
1. The steam room / hot water facility requires the prior approval of a Plant Protection and Inspection Services inspector.
2. An alternative treatment can be used for this product: irradiation treatment as written in this manual.

The Product: *Tropaeolum majus*
Form of Product: Seeds for propagation

Treatment Target: Bacteria
Treatment: Hot water immersion

<i>Temperature (degrees Celsius)</i>	<i>Concentration (-)</i>	<i>Treatment Duration (minutes)</i>
See note	-	

Notes: The import requirements for this product were updated and this treatment is no longer required.

The Product: *Liatrix*
Form of Product: Bulbs for propagation

Treatment Target: Nematodes
Treatment: Hot water immersion

<i>Temperature (degrees Celsius)</i>	<i>Concentration (-)</i>	<i>Treatment Duration (minutes)</i>
48	-	60

Notes:

The Product: Narcissus
Form of Product: bulbs for propagation

Treatment Target: Onion flies and mites

The treatment will be performed in one of the following manners:

1. Hot water immersion as specified in the table, and then immersion in a 0.5% concentration of Diazinon (500 cc / 100 liters)for 30 minutes.
2. Hot water immersion as specified in the table, and then immersion in a 0.1% concentration of Imidacloprid (100 cc / 100 liters) for 30 minutes.

<i>Temperature (degrees Celsius)</i>	<i>Concentration (-)</i>	<i>Treatment Duration (minutes)</i>
43.5		240

Notes:

3. Immersion treatments

3.1 Immersion in disinfectant

The Product: Persimmon – *Diospyros spp.*

Form of Product: Seeds for propagation

Treatment Target: External bacteria

Treatment: Immersion (sodium hypochlorite)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (percentage)</i>	<i>Treatment Duration (minutes)</i>
-	0.5	2

Notes:

The Product: Citrus

Form of Product: Seeds for propagation

Treatment Target: Bacteria

Treatment: Immersion (sodium hypochlorite)

<i>Temperature (degrees Celsius)</i>	<i>Concentration (percentage)</i>	<i>Treatment Duration (minutes)</i>
-	0.5	2

Notes:

The Product: Agricultural machinery

Form of Product: Used agricultural equipment

Treatment Target: Disinfection and various insects

Treatment:

1. Spray the driver's cabin with an aerosol of DDVP 0.5%

2. In addition, use one of the substances listed in the table below and spray to runoff:

<i>Substance</i>	<i>Concentration (percentage)</i>	<i>Treatment Duration (minutes)</i>
Sodium carbonate	4%	
Orthophenylphenate	2%	
Stroke environ	4%	
Stroke vesphene	4%	

Notes: The equipment will be treated only after being checked by an inspector of the Plant Protection and Inspection Services and found to be clean of soil and plant residues.

3.2 Immersion in Pesticides

The Product: Rose

Form of Product: Branches (not rooted)

Treatment Target: Bacteria and fungi

Treatment:

1. Immersion in Abamectin 0.1%

2. In addition, immersion in one of the substances listed in the table below:

Substance	Concentration (percentage)	Treatment Duration (minutes)
Methidathion	0.2%	
Pyriproxyfen	100 g/l	

Notes:

The Product: Eggplant – *Solanum melongena*

Form of Product: Seeds for propagation

Treatment Target: Bacteria and fungi

Treatment: immersion and dusting

The treatment will be performed with one of the following combinations:

1. Sodium hypochlorite and Thiram

2. Carbendazim and Thiram

Substance	Concentration	Treatment Duration (minutes)
Sodium Hypochlorite	0.5 %	2
Thiram	2 g/kg	
Carbendazim	0.5 g/kg	

Notes: The treatment duration for each of the combinations is 2 minutes.

The Product: *Cosmos Cav.*

Form of Product: Seeds for propagation

Treatment Target: Fungi

Treatment: Dusting with Thiram

Substance	Dosage	Treatment Duration (minutes)
Thiram	2 g/kg	

Notes:

The Product: Soybean – *Glycine*
Form of Product: Seeds for propagation

Treatment Target: Fungi
Treatment: Dusting with Carboxin 200 g per liter and Thiram 200 grams per liter

<i>Substance</i>	<i>Dosage</i>	<i>Treatment Duration (minutes)</i>
Thiram and Carboxin	3 liters / ton	

Notes:

The Product: Corn – *Zea mays*
Form of Product: Seeds for propagation

Treatment Target: Fungi
Treatment:
 The seeds will be treated with one of the combinations according to the options specified in the table below:

		<i>Substance</i>	<i>Concentration</i>	<i>Treatment Duration (minutes)</i>
Option A Two substances in parallel And one of the substances listed in section 2	1.	Carboxin 200 grams per liter and Thiram 200 grams per liter	5 liters / ton	
	2.	Metalaxyl (WP)25% or Mefonoxam	0.5% 0.05%	
Option B Three substances in parallel	1.	Fludioxonil	0.25 g/kg	
	2.	Metalaxyl-M	0.2 g/kg	
	3.	Thiram	84 g/kg	

Notes:

The Product: Clover – *Trifolium L.*
Form of Product: Seeds for propagation

Treatment Target: Fungi
Treatment: Dusting with Thiram

<i>Temperature (degrees Celsius)</i>	<i>Dosage</i>	<i>Treatment Duration (minutes)</i>
-	2 (g/kg) (Thiram)	

Notes:

4. Irradiation Treatment

4.1 Gamma Irradiation

The Product: Ginger – *Zingiber officinale*

Form of Product: Fresh vegetables for consumption

Treatment Target: Nematodes

Treatment: Irradiation

<i>Gamma Irradiation</i>	<i>Dosage (Kilogray)</i>	<i>Treatment Duration (minutes)</i>
Gamma Irradiation	range of 2-10 Kilogray	

Notes: This product can also undergo heat treatment (hot water / steam vapor) as written in Section 3 of this manual.
