

IMPORTANT INFORMATION

FOR PROFESSIONAL USE ONLY AS AN INSECTICIDE

Crops/situations	Maximum individual dose	Maximum number of treatments
Latest time of application	Other specific restrictions	
Refer to the leaflet attached to the product pack for full details.		

READ THE LABEL BEFORE USE. USING THIS PRODUCT IN A MANNER THAT IS INCONSISTENT WITH THE LABEL MAY BE AN OFFENCE. FOLLOW THE CODE OF PRACTICE FOR USING PLANT PROTECTION PRODUCTS.

THE (COSHH) CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH REGULATIONS MAY APPLY TO THE USE OF THIS PRODUCT AT WORK.

SAFETY PRECAUTIONS

applicable to the correct use of this product are contained within the leaflet attached to the product pack.



SHURIKEN I

MAPP 21657

A selective insecticide for use in field vegetables and fruit crops for the control of caterpillar pests and useful control of cabbage root fly and thrips (including Western flower thrips).

A suspension concentrate containing 480 g/L (44.03% w/w) spinosad.

FOR PROFESSIONAL USE AS AN INSECTICIDE

GROUP 5 INSECTICIDE



WARNING

VERY TOXIC TO AQUATIC LIFE WITH LONG LASTING EFFECTS.

Collect spillage.
Dispose of contents/container to a licensed hazardous waste disposal contractor or collection site except for empty, clean containers which can be disposed of as non-hazardous waste.

Contains 1,2-benzisothiazolin-3-one. May produce an allergic reaction.
To avoid risks to human health and the environment, comply with the instructions for use.

06/26

500ml e

Authorisation Holder & Marketing Company

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SAFETY PRECAUTIONS

Operator Protection

Engineering control of operator exposure must be used where reasonably practicable in addition to the following personal protective equipment:
WEAR SUITABLE PROTECTIVE GLOVES when handling the concentrate and when applying by hand-held equipment.
However, engineering controls may replace personal protective equipment if a COSHH assessment shows they provide an equal or higher standard of protection.
WASH HANDS AND EXPOSED SKIN before meals and after work.
WASH CONCENTRATE from skin or eyes immediately.

Environmental Protection

Do not contaminate water with the product or its container. (Do not clean application equipment near surface water/Avoid contamination via drains from farmyards and roads).
To protect aquatic organisms, respect an unsprayed buffer zone to surface water bodies of 40 metres for applications from broadcast air-assisted sprayers and 5 metres for applications from horizontal boom sprayers.



DO NOT ALLOW DIRECT SPRAY from broadcast air-assisted sprayers to fall within 40 metres of the top of the bank of a static or flowing waterbody, unless a Local Environment Risk Assessment for Pesticides (LERAP) permits a narrower buffer zone, or within 5 metres of the top of a ditch which is dry at the time of application. Aim spray away from water.
DO NOT ALLOW DIRECT SPRAY from horizontal boom sprayers to fall within 5 metres of the top of the bank of a static or flowing water body, or within 1 metre of the top of a ditch which is dry at time of application. Aim spray away from water. Spray from hand-held sprayers must not be allowed to fall within 1 m of the top of the bank of a static or flowing waterbody.
This product qualifies for inclusion within the Local Environment Risk Assessment for Pesticides (LERAP) scheme. Before each spraying operation from a horizontal boom sprayer or broadcast air-assisted sprayer, either a LERAP must be carried out in accordance with HSE's published guidance or the statutory buffer zone must be maintained. The results of the LERAP must be recorded and kept available for three years.

Storage and Disposal

KEEP AWAY FROM FOOD, DRINK AND ANIMAL FEEDINGSTUFFS.
WASH OUT CONTAINER THOROUGHLY, empty washings into the spray tank and dispose of safely.
DO NOT RE-USE CONTAINER for any purpose.

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Crops/situations	Maximum individual dose	Maximum number of treatments	Latest time of application
Apple, pear, crab apple, quince			
pre-blossom	150 mL product/ha	1 per crop	7 days before harvest
AND/OR			
post-blossom	250 mL product/ha	3 per crop	
Broccoli (outdoor), Brussels sprout (outdoor), cabbage (outdoor), calabrese (outdoor), cauliflower (outdoor), broccoli (outdoor), calabrese (outdoor), Chinese cabbage (outdoor)	12 mL product/1000 module plants	1 per crop (See Other Specific Restrictions)	Pre-planting, 6 leaf stage
Broccoli (outdoor), Brussels sprout (outdoor), cabbage (outdoor), calabrese (outdoor), cauliflower (outdoor), Chinese cabbage (outdoor)	200 mL product/ha	4 per crop	3 days before harvest
Leek (outdoor), bulb onion (outdoor), salad onion (outdoor), garlic (outdoor), shallot (outdoor)	200 mL product/ha	3 per crop	7 days before harvest
Strawberry (protected)	150 mL product/ha (15 ml per 100 litres of water)	3 per crop (See Other Specific Restrictions)	1 day before harvest

Other Specific Restrictions:

For protected strawberry apply a maximum of 2 consecutive sprays followed by a minimum 28-day interval before any further applications.

Following Brassica pre-planting applications, only 2 further applications of spinosad may be made. Module drench treatments to brassica crops must not be made by hand-held equipment.

In protected situations the total number of applications of any spinosad containing product must not exceed 6 per glasshouse/protected structure in a 12-month period, regardless of the crop being treated (including ornamentals).

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DIRECTIONS FOR USE

IMPORTANT: This leaflet is approved as part of the Product Label. All instructions within this section must be read carefully in order to obtain safe and successful use of this product.

NOTES

NINJA SHURIKEN insecticide has a very specific pest spectrum. Only apply NINJA SHURIKEN against pests and crops on the label. Taint tests have not been conducted using NINJA SHURIKEN. Growers should consult processors before use.

Following application allow 12 hours for NINJA SHURIKEN to become rainfast before applying irrigation. Wash spray tank and equipment (including knapsack sprayers) thoroughly with water and a liquid detergent immediately after use. Spray out. Fill with clean water and leave overnight. Spray out again before using another product.

MODE OF ACTION

NINJA SHURIKEN enters the insect primarily through contact and ingestion. Contact occurs by direct application or by insect movement on a treated surface. Ingestion occurs from feeding on treated surfaces. Following entry, NINJA SHURIKEN acts on a unique neuro-receptor site of the insect.

Symptoms appear almost immediately, and complete mortality occurs within a few hours. NINJA SHURIKEN is not systemic but does show translaminar movement.

CROP SAFETY

Outdoor Crops

NINJA SHURIKEN has been tested on a wide range of outdoor crops. NINJA SHURIKEN has good plant safety when applied at different growth stages, including flowering.

Modular drench application to brassicas

Users should refer to and follow the specific instructions for applying drench treatments.

Protected Strawberry

It is recommended to test NINJA SHURIKEN on a small number of plants to confirm the crop safety before spraying a large area.

RESISTANCE

GENERAL

To reduce the possibility of the development of resistance:

- Total reliance on one pesticide will hasten the development of resistance: spinosad has a different mode of action from other insecticides and is most effective when applied in planned programmes with other insecticides with different modes of action.
- Avoid use of the same active ingredient or mode of action on consecutive generations of insects. However, multiple applications to reduce a single generation are acceptable.
- If uncertain of the generation cycle, no more than two consecutive applications (two for protected crops) should be used nor should there be continuous use for more than 30 days. Do not use NINJA SHURIKEN on consecutive generations for insects which show a high risk of resistance such as thrip species.
- Restrict the number of sprays to no more than six applications per glasshouse/protected structure in a 12-month period of any spinosad containing product regardless of crop being treated (including ornamentals).
- Do not use reduced label rates when applied alone or in tank-mixtures.

OUTDOOR CROPS

- Onion thrips have shown resistance to certain chemical groups including spinosad. Where resistance is confirmed, NINJA SHURIKEN is unlikely to give satisfactory control. Resistance management steps should be taken as it is considered a high resistance risk pest in protected crops plants, carry out careful monitoring.
- Apply when onion thrips are first seen and repeat the application if needed after 10 days for leeks, bulb onion, salad onion, garlic and shallot. It is vital that NINJA SHURIKEN is applied before the pest becomes well established in the crop.

PROTECTED STRAWBERRY CROPS

- Western flower thrips have shown resistance to certain chemical groups including spinosad. Where resistance is confirmed, NINJA SHURIKEN is unlikely to give satisfactory control. Resistance management steps should be taken as it is considered a high resistance risk pest in protected crops/plants, carry out careful monitoring.

- Before undertaking a spray programme with NINJA SHURIKEN establish whether incoming plant material has previously been treated with NINJA SHURIKEN or another spinosad containing product.
- Carry out careful monitoring and apply when Western flower thrips are first seen making repeat applications at 7-day intervals only if needed, with a maximum of two consecutive spinosad sprays to protected strawberry. Leave at least 28 days before any further applications of NINJA SHURIKEN (or any other spinosad containing product) in the structure (even if only treating some of the plants).
- For protected strawberry crops restrict the total number of sprays to no more than three applications of NINJA SHURIKEN per strawberry crop. In multi-cropping situations restrict the total number of sprays to no more than 6 in a 12-month period in the same glasshouse or structure of any spinosad containing product regardless of the crop being treated (including ornamentals and all year round (AYR) chrysanthemums).
- DO NOT EXCEED 6 APPLICATIONS OF ANY PRODUCT CONTAINING SPINOSAD PER GLASSHOUSE/PROTECTED STRUCTURE IN A 12-MONTH PERIOD.
- Apply in programmes with other insecticides with a different mode of action and use no further sprays of NINJA SHURIKEN (or any other spinosad-containing product) once the maximum number of sprays have been applied.
- If the final insecticide application to a crop was spinosad, choose a different insecticide active ingredient to begin spraying on the next crop.
- Applications should be targeted against early insect developmental stages whenever possible.
- Do not use reduced label rates.
- Whenever possible use an Integrated Pest Management programme.
- Choose resistant cultivars.
- Apply no further sprays of NINJA SHURIKEN (or any other spinosad containing product) once the maximum number of foliar sprays have been applied (or a maximum of 2 foliar sprays on brassicas if a pre-planting modular drench application of NINJA SHURIKEN has already been made).
- If thrips are already established, consider using a product with knockdown activity such as dimethoate before applying NINJA SHURIKEN.

- On brassicas, only one pre-planting modular drench application should be made per crop to protect against attack from cabbage root fly with subsequent foliar applications of NINJA SHURIKEN restricted to 2 sprays per crop.
- Carry out careful monitoring. For caterpillar control apply NINJA SHURIKEN at egg hatch in top fruit and when pests are first seen in other field crops. Repeat applications at 10-day intervals only if needed.
- Applications should be targeted against early insect developmental stages whenever possible.
- If possible, include multiple tactics (eg cultural or biological controls) when using Integrated Pest Management Programmes.
- Use NINJA SHURIKEN in programmes with other effective insecticides of a different mode of action to reduce the possibilities of resistance occurring.

INTEGRATED PEST MANAGEMENT

- Whenever possible use an Integrated Pest Management programme.
- For further information and the latest advice on beneficial insects and mites and their integrated use with NINJA SHURIKEN consult Ninja Agriculture.

BEES

Do not apply in the heat of the day when bees may be foraging as contact with direct spray may be harmful. Remove the hive during spraying as exposure to direct spray may be harmful to bees. It is recommended that a period of 24 hours after application and all spray deposits are thoroughly dry before exposure of bees. Water pools with residues of spinosad will continue to pose a risk and should be avoided.

OUTDOOR CROPS

- NINJA SHURIKEN can be used in an integrated pest management strategy in top fruit as it has been found to have no long-term adverse effects on predatory bugs *Anthrenus* spp or the predatory mite *Typhlodromus pyri*.
- Overall applications of NINJA SHURIKEN to control pests in field brassicas, leeks, onions and strawberry are of low risk to predatory insects and mites both in the plant canopy and on the soil below. There is risk to parasitic *Hymenoptera*, but these effects are of short duration (2 weeks) as the persistence of NINJA SHURIKEN is low and recovery of these highly mobile species would be rapid.
- NINJA SHURIKEN, when used according to good agricultural practice is unlikely to pose an unacceptable risk to honeybees and beneficial arthropods.

Modular Drench application

It is best practice to make module spray applications in a specific spray area away from other plants where beneficial insects may be present. If this is not possible then do not make an application of NINJA SHURIKEN where populations of beneficial insects and especially parasitic wasps are present in high numbers.

If module plants are raised as part of an integrated pest management system then follow the directions given for protected crops.

PROTECTED CROPS

As part of an Integrated Pest Management programme:

- Inspect all incoming plant material for presence of Western flower thrip and treat if necessary.
- Monitor stock routinely to determine the need for control measures.
- Use screens or barriers to prevent insects migrating.
- Use predators and parasites.
- Exposure to direct spray is harmful to bumble bees, but dry spray deposits are harmless.
- Carefully choose any chemical products used in the pesticide programme and consider any side effects on bees and beneficial arthropods.

NINJA SHURIKEN has been tested on a wide range of predators and parasites used to control pests in protected crops. The active ingredient, spinosad has been shown to be of low impact to many insect and mite predators but harmful to adults of most parasitic wasps (*Hymenoptera*).

When applied to plants where insect and mite predators are present NINJA SHURIKEN may cause a temporary reduction in abundance.

For susceptible predators (parasitic *Hymenoptera*) re-introduction is possible after 7 days following application (with perhaps 14 days in winter months). For most other predators, introduction is possible 24 hours after application.

Re-introduction of *Orius laevigatus* is advised one week later.

Beneficials may be safely introduced to treated plants after an application of NINJA SHURIKEN according to the following table:

NINJA SHURIKEN Recommendations for Integrated Use with Predators and Parasites			
Beneficial Type	Species	*Toxicity Class Rating	Introduction Best Practices
Predatory mites	<i>Phytoseiulus persimilis</i>	Harmless (1)	Data suggest predatory mites introduced when spray deposits are dry may be affected but will recover after 24 hours.
	<i>Amblyseius californicus</i>	Harmless (1)	
	<i>Amblyseius cucumeris</i>	Harmless (1)	
Predatory insects	<i>Chrysoperla carnea</i>	Harmless (1)	Data suggest predatory insects introduced when spray deposits are dry may be affected but will recover after 24 hours. <i>O. laevigatus</i> in best introduced after 7 days. <i>M. caliginosus</i> may be introduced on the day of application once spray deposits are dry. If NINJA SHURIKEN is applied directly to plants containing <i>M. caliginosus</i> there may be a short-term reduction in numbers.
	<i>Orius laevigatus</i>	Slightly harmful (2)	
	<i>Orius insidiosus</i>	Harmless (1)	
	<i>Aphidoletes aphidimyza</i>	Harmless (1)	
	<i>Macrolophus caliginosus</i>	Harmful (4)	
Parasitic wasps	<i>Aphidius colemani</i>	Moderately Harmful (3)	Direct applications of NINJA SHURIKEN are harmful to parasitic wasps. Wait at least 7 days after an application of NINJA SHURIKEN before introducing new parasites.
	<i>Encarsia formosa</i>	Moderately Harmful (3)	
	<i>Trichogramma brassicae</i>	Harmful (4)	
	<i>Diglyphus isaea</i>	Harmful (4)	

*Toxicity ratings

Class 1 Harmless less than 25% reduction **Class 2** Slightly harmful 25-50% reduction **Class 3** Moderately harmful 50-75% reduction **Class 4** Harmful more than 75% reduction

APPLE, PEAR, CRAB APPLE, QUINCE

NOTES

To avoid variable performance timing of application should be optimised and good coverage of the foliage should be achieved. Optimal timing of application of NINJA SHURIKEN post-blossom for control of caterpillars is when first egg hatch is predicted based on threshold counts in pheromone traps being reached. It is important when making applications to top fruit to use sufficient water volume to achieve effective coverage and penetration of the foliage.

Where tree height and/or canopy density is reduced, the dose (and water volume) should be adjusted in accordance with an appropriate dose adjustment scheme. Consult your specialist advisor for further information. Further information on the PACE scheme is available from AHDB.

PRE-BLOSSOM

Pest	Over wintered Tortrix moths
Rate	150 mL/ha
Water volume	300 to 1500 litres of water per hectare
Maximum number of applications	One pre-blossom
Time of application	Apply pre-blossom from early green cluster when first signs of active larvae which spin themselves into webs are first observed.
Latest time of application	7 days before harvest

POST-BLOSSOM

Pest	Summer fruit Tortrix moth, codling moth
Rate	250 mL/ha
Water volume	300 to 1500 litres of water per hectare
Maximum number of applications	3 post-blossom

Time of application	Apply post-blossom when first egg hatch is predicted based on threshold counts in pheromone traps being reached. Carefully monitor pest development to determine whether repeat applications are necessary. If required, make a repeat application of NINJA SHURIKEN (or a similar compound with activity against moth larvae) timed to coincide with egg hatch of the larvae. Effective control of caterpillars in top fruit usually requires several insecticide sprays per year. A 2 or 3 spray programme at 10 day intervals may be needed when conditions favour rapid pest development. Where possible, apply NINJA SHURIKEN in programmes with products with a different mode of action as a good resistance management strategy. Codling moths, summer fruit Tortrix moths: Mid June to August in most seasons. Fruit tree Tortrix moth: Limited data suggest that useful control of fruit tree Tortrix moths can be achieved when the label rate for summer fruit Tortrix moth and codling moth is applied. Severe or late attacks in late July or early August may require further applications.
Latest time of application	7 days before harvest

OUTDOOR BRASSICA CROPS (Broccoli, Brussels sprout, cabbage, calabrese, cauliflower, chinese cabbage)

Pest	Cabbage root fly
Rate	60 mL/5000 plants
Water volume	5 litres of water per 5000 plants
Maximum number of applications	1 prior to planting out. Following modular drench treatment with NINJA SHURIKEN only 2 foliar applications of spinosad may be made to the crop.
Time of application	Crops should be treated ideally at the 3 to 4 leaf stage. Only good crops with good leaf condition that are growing vigorously should be treated.
Latest time of application	6 leaf stage.

Application is a three stage process:

- moisten the leaves of the plants to be treated immediately prior to treatment.
 - apply the NINJA SHURIKEN drench.
 - wash off the NINJA SHURIKEN drench from leaves of plants with water.
- It is important that the total volume of water used in these three stages does not exceed the water holding capacity of the modules, otherwise leaching of the NINJA SHURIKEN will occur which may reduce cabbage root fly control and lead to contamination of underlying glasshouse soil (see 'Notes' below).

The water volumes below are given as a guide for modules of 11 to 13 mL capacity (the minimum size and hence the minimum volume recommended). Larger volumes can be used with larger modules.

Leaves of the plants should be wetted with a light spray of water immediately before treatment using 2 litres per 5,000 plants.

NINJA SHURIKEN should then be applied at 60 mL in 5 litres of water per 5,000 plants.

Immediately after treatment the insecticide must be thoroughly washed off the leaves of the plant with clean water, using 5 litres of water per 5,000 plants.

NOTES FOR MODULE APPLICATION

NINJA SHURIKEN **MUST BE APPLIED ALONE**. Tank-mixing of NINJA SHURIKEN for this use may produce severe leaf scorch.

NINJA SHURIKEN will provide partial or useful control of cabbage root fly between 6 to 8 weeks after treatment and will improve plant establishment and reduce root damage with the resultant marketable yield benefits.

If plants are still vulnerable and there is a risk of further infestation after this time, then a follow up application in the field may be required with a suitable product. This is particularly important if plants are treated before the start of April and the arrival of the first generation.

Breakdown of NINJA SHURIKEN in soils inside glasshouses is rapid and spinosad does not accumulate or leach in soils. However, best practice should avoid applying NINJA SHURIKEN in such a large volume of water that it passes through the compost. Also prevent the spray

contaminating the pathways and covered areas surrounding the trays being treated. This can be done in a number of ways eg interceptor trays, polythene sheeting, use of correct water volumes etc. After use, remove plastic sheeting, wash down and dispose of safely.

When handling recently drenched trays of plants it is best practice to wear protective rubber gloves and coveralls.

Modules should generally be transplanted as soon as possible after treatment. However, NINJA SHURIKEN can be leached out of the compost if the modules are over watered and so best practice is to not move the plants for the first 24 hours after application. If plants are to be dispatched freshly watered, NINJA SHURIKEN should be applied a few days beforehand to ensure that it is not leached from the module during the final watering.

Transplanting of treated blocks and modules to a depth which brings untreated soil into contact with plant stems above the top of the block or module will lead to reduced control. Further treatments to control cabbage root fly larvae may be required in areas of high activity.

OUTDOOR BRASSICA CROPS (Broccoli, Brussels sprout, cabbage, calabrese, cauliflower, chinese cabbage)

FOLIAR TREATMENT

Pest	Caterpillars: Control of Diamond back moth, small cabbage white butterfly, large cabbage white butterfly, and useful control of large cabbage moth
Rate	200 mL/ha
Water volume	200 to 600 litres of water per hectare
Maximum number of applications	4 per crop OR if a modular drench application of NINJA SHURIKEN has been made, 2 per crop on brassicas.
Time of application	Spray when damage is first seen, and preferably when caterpillars are small. If repeat applications are required try to use in programmes with other insecticides with a different mode of action.
Latest time of application	3 days before harvest

PROTECTED CROPS OF STRAWBERRY

Pest	Control of Western Flower Thrip
Rate	15 mL per 100 litres of water (to a maximum of 150 mL/ha)
Water volume	200 to 1000 litres of water
Maximum number of applications	3 per crop (2 consecutive)
Time of application	It is important to monitor pest levels. Apply when nymphs and adults are first observed or at very first signs of crop damage. Applications should be made before thrips are established. During spraying, make sure that the inside and outside parts of the leaves and flowers are covered. The spray technique and the amount of water must cover the plant without causing run-off and control often depends on the quality of the spraying (machinery, quantity of water, etc). Best control is achieved by a sequence of 2 treatments at 7 day intervals (if needed). For resistance management purposes there must be a minimum interval of 28 days after the second application before any further applications of NINJA SHURIKEN are made. This is an opportunity to allow beneficial insects to be effective in IPM programmes. Restrict the number of sprays to no more than 6 applications per glasshouse/ structure in a 12 month period of any spinosad containing product regardless of crop (including ornamentals) being treated. NINJA SHURIKEN should be applied in programme with other insecticides and in combination with integrated pest management.
Latest time of application	1 day before harvest

MIXING

To ensure thorough mixing of the product invert the container several times before opening. Half-fill the spray tank with water, begin agitation and add the required quantity of NINJA SHURIKEN. Fill up the spray tank, agitating continuously to ensure thorough mixing, and maintain agitation until spraying is complete. Use only clean water for mixing. Use the spray solution immediately after preparation.

SPRAY VOLUME

Water volume should reflect the need for uniform cover and penetration of the leaf canopy.

Crop	Water Volume	Comment
Apple, pear, crab apple, quince	Min: 300 litres/ha Max: 1500 litres/ha	It is particularly important when spraying post-blossom to achieve full penetration of the leaf canopy and uniform coverage of the foliage and blossoms or fruitlets.
Broccoli, Brussels sprout, cabbage, calabrese, cauliflower, Chinese cabbage, leek, bulb onion, salad onion, garlic, shallot	Min: 200 litres/ha Max: 600 litres/ha	Ensure good penetration of the foliage.
Strawberry (protected)	Min: 200 litres/ha Max: 1000 litres/ha	Ensure good penetration of the foliage.

APPLICATION EQUIPMENT

Apply NINJA SHURIKEN using a horizontal boom sprayer or a broadcast air assisted sprayer. For protected strawberry crops apply NINJA SHURIKEN by conventional hydraulic sprayer or by handheld applicators. Ensure spray equipment is in good working order and has been calibrated according to the manufacturers' recommendations.