

FORMIC PRO – FAQs



NORTH AMERICAN

PRODUCT HISTORY

WHAT IS THE DIFFERENCE BETWEEN FORMIC PRO AND THE MITE AWAY QUICK STRIPS?

Formic Pro is the next generation product to the Mite Away Quick Strips formulation. The major differences include the shelf life, 24-months (FP) vs. 12-months (MAQS), treatment period, 14 or 20 days (FP) vs. 7 or 21 days (MAQS) and storage requirements, out of direct sunlight (FP) vs. under 25°C/77°F (MAQS).

PLANNING A TREATMENT

WHY AND WHEN SHOULD I USE FORMIC PRO?

Use Formic Pro as part of an integrated pest management (IPM) program. There are two treatment options when local thresholds are met:

Option One: 2 strips for 14 days.

Option Two: 1st strip for 10 days remove and replace with 2nd strip for an additional 10 days.

Timing: It is highly recommended to monitor phoretic mite levels monthly during periods of brood rearing and treat when local thresholds are reached. Treat during the colony population increase phase to protect the bees going into the honey flow. Treat during the colony decrease phase to protect the bees that will make up the winter cluster. In warmer climates, additional treatments may be necessary due to longer brood rearing time. Missed treatments can lead to excessive varroa loads and may require more than one treatment.

HOW CAN I BEST PREPARE MY BEES FOR TREATMENT?

Keep your bees well fed and monitor mite levels to keep viruses under control. Higher bee death may be observed in colonies with high virus levels. If necessary, feed your bees before treating with Formic Pro.

WHY SHOULD I USE AN INTEGRATED PEST MANAGEMENT PROGRAM (IPM) INSTEAD OF TREATING WHEN I START TO SEE ISSUES?

An IPM includes protocols for regular mite checks and treatments, as well as colony nutrition. If beekeepers see Deformed Wing Virus (DWW), Parasitic Mite Syndrome (PMS) and/or Idiopathic Brood Disease ('snot brood'), it may be too late. Mites reproduce exponentially, and high infestations can quickly take over and crash a colony, especially when bee populations decline in the fall.

Healthy Bees. Healthy Planet.

Head Office, Canada: NOD Apiary Products Ltd. PO Box 117, 2325 Frankford Road, Frankford, Ontario
T: +1 613-398-8422 • F: +1 613-398-0495 • E: info@nodglobal.com • www.nodglobal.com

FORMIC PRO – FAQs



NORTH AMERICAN

WHAT ARE THE TEMPERATURE GUIDELINES FOR FORMIC PRO?

Outside daytime highs should be between 50 - 85°F on day of application. Hot temperatures ($\geq 92^\circ\text{F}$ during the first 3 days) may lead to excessive bee, brood and queen loss.

IS IT TOO COLD TO TREAT?

Use *Formic Pro* when outside daytime temperatures are above 10°C/50°F. As the bees play an active role in moving the formic acid vapour throughout the hive, it's important they not be in cluster and bringing fresh air in the hive entrance. Nighttime temperature lows may reach below the outside daytime temperatures without issue.

CAN I FEED OR WORK THE BEES DURING THE TREATMENT PERIOD?

Do not disturb colonies during the treatment period. Barrel feeding is acceptable because it is external and does not interfere with affairs inside the hive.

PERSONAL PROTECTIVE EQUIPMENT (PPE) & HANDLING

WHAT TYPE OF PROTECTIVE CLOTHING SHOULD I WEAR WHEN WORKING WITH FORMIC PRO?

Handler Personal Protective Equipment (PPE): Applicators and other handlers must wear coveralls over a long-sleeved shirt, long pants, socks and shoes, acid resistant gloves (PVC, neoprene, or nitrile), and protective eyewear. Clean or replace PPE at end of each day's work period. Rinse off pesticides at rest breaks. Follow the manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations: Users should remove Personal Protective Equipment/clothing immediately if pesticide gets inside. Wash thoroughly and put on clean clothing. Replace chemical gloves if punctured or stretched.

Have water readily available should skin or eye contact occur.

Only use outdoors, stand upwind of product. Use caution when opening the container, especially in warm weather.

STORAGE

HOW SHOULD I STORE FORMIC PRO PAILS?

Healthy Bees. Healthy Planet.

Head Office, Canada: NOD Apiary Products Ltd. PO Box 117, 2325 Frankford Road, Frankford, Ontario
T: +1 613-398-8422 • F: +1 613-398-0495 • E: info@nodglobal.com • www.nodglobal.com

FORMIC PRO – FAQs



NORTH AMERICAN

Store indoors, in original container, out of direct sunlight, in a cool, dry and well-ventilated area away from sulphuric acid, oxidizing agents, and sources of ignition and away from the reach of children. Avoid heat, sparks, and open flames. Do not eat, drink or smoke in areas of use or storage. Use caution when opening the container, especially in warm weather (i.e.: open outdoors and stay upwind). Keep separate to prevent cross contamination of other pesticides, fertilizer, food, or feed.

WHAT IS THE SHELF LIFE FOR FORMIC PRO?

Formic Pro has a two-year (24-month) shelf life when stored as per label. Each product pail has an expiry date printed on the label, after which it is no longer legal for use. Check pail expiry date before purchase.

WILL FREEZING THE STRIPS EXTEND THE SHELF LIFE?

No. It is a violation of federal law to use Formic Pro past the expiry date. Freezing does not lengthen the shelf life, but cold temperatures do keep the product fresher throughout its two-year shelf life.

HIVE TYPE & SIZE

I ONLY WANT TO TRY FORMIC PRO ON A FEW HIVES IN MY APIARY. IS THIS OK?

No. Formic Pro should be used to treat all colonies in the apiary at the same time to prevent re-infestation. If you are wanting to test the product on a small number of colonies, prepare the colonies in a separate yard for this purpose. Bees have an average foraging radius of 3km (1.8 mi), so know your beekeeping neighbours and encourage them to treat with Formic Pro at the same time.

CAN I TREAT MY NEWLY SPLIT NUCS, IF THEY CONTAIN ONLY 4 OR 5 FRAMES OF BEES?

Nucleus box designs vary and most do not have the ventilation required for Formic Pro use, even for a single strip treatment. Without a full bottom entrance (full width of a full-size hive, ½inch(1.3cm) high), hive ventilation during treatment is compromised. Formic Pro should only be applied on single or double brood chamber standard Langstroth equipment or equivalent (e.g. Dadant). The Honey bee colony cluster must cover a minimum of 6 brood frames (approximately 10,000 bees). If you move your nucs into full size brood chambers and allow them time to expand to a full six frames, you can then treat with Formic Pro. Always remember to wait 24 hours after working your bees to treat with Formic Pro.

HOW DO I KNOW IF MY HIVE TYPE IS SUITABLE FOR USE WITH FORMIC PRO?

Formic Pro is designed for use with standard Langstroth equipment or equivalent (e.g. Dadant), single or double brood chamber hives. The colony should be a minimum of 10,000 bees, covering approximately six 9" deep frames. An entrance must be provided that is the full width of the hive, typically the bottom

Healthy Bees. Healthy Planet.

Head Office, Canada: NOD Apiary Products Ltd. PO Box 117, 2325 Frankford Road, Frankford, Ontario
T: +1 613-398-8422 • F: +1 613-398-0495 • E: info@nodglobal.com • www.nodglobal.com

FORMIC PRO – FAQs



NORTH AMERICAN

board entrance, minimum height ½ inch. The bottom entrance must be fully open for the entire duration of treatment. Any restriction on the entrance into the brood chamber (e.g. reducer or mouse guard) must be removed to prevent excessive damage to the colonies. Screen bottom boards should be closed off during treatment to prevent formic acid vapor loss. Screen bottom boards should not be considered a source of fresh air as bees are not designed to move air up through the screen.

Other hive designs have not been thoroughly tested and may not support the ventilation requirements for a successful *Formic Pro* treatment.

I USE POLYSTYRENE BEEHIVES IN MY OPERATION, CAN I USE FORMIC ACID WITHOUT MELTING MY BEEHIVES OR HAVING SOME OBSCURE CHEMICAL REACTION?

NOD tested pieces of polystyrene and there was no indication that contact with formic acid caused any melting or chemical reaction. Some polystyrene hives require modifications to the hive entrance size in order to meet the label requirements.

VENTILATION

SHOULD I CLOSE OFF ALL ENTRANCES EXCEPT THE FULLY OPEN BOTTOM ENTRANCE?

Ventilation is critical when using Formic Pro. A fully open bottom entrance, 13 mm (0.5”) in height and full width of the hive, are the minimum ventilation requirements. Having additional entrances does not seem to affect the efficacy of the treatment. Close off screen bottom boards for maximum efficacy. Do not consider open screen bottom boards as ‘ventilation’, as bees draw air to ventilate the colony through the front hive entrance.

HOW CAN I ADJUST MY HIVE CONFIGURATION TO MAKE IT SUITABLE FOR FORMIC PRO?

- If a hive design has an entrance where there are internal obstructions between the landing board and the brood chamber, the brood chamber can usually be tipped back to meet the hive entrance requirements. Wedges can be used to hold the brood chamber in place. Because the floor directly under the brood chamber is not solid (often slats), there may be a decrease in efficacy.
- For hives with floors with permanently reduced entrances the second brood chamber can be set back by 1.3mm or 1/2” to create an entrance the full width of the hive during the treatment.

Healthy Bees. Healthy Planet.

Head Office, Canada: NOD Apiary Products Ltd. PO Box 117, 2325 Frankford Road, Frankford, Ontario
T: +1 613-398-8422 • F: +1 613-398-0495 • E: info@nodglobal.com • www.nodglobal.com

FORMIC PRO – FAQs



NORTH AMERICAN

- It is recommended to place an empty honey super on the hive to give the bees room to expand the cluster. There is no loss in efficacy. It is also recommended when treating in late summer and early autumn, to treat while the last honey super is still in place.
- If a bottom board has brood chamber support rims that are less than the minimum 13mm (.5") height, shims (tapered wedges) can be inserted under the lower front corners of the brood chamber to increase the entrance opening to a minimum of 13mm (0.5") to comply with the label.

SHOULD I LEAVE THE SCREEN BOTTOM OPEN OR CLOSE IT OFF?

It is recommended to close off screen bottom boards.

Randy Oliver (www.scientificbeekeeping.com) ran a trial with screen bottom boards and published the results in the February 2011 issue of American Bee Journal. There was a 4% to 5% reduction in efficacy compared to colonies treated in hives with solid bottom boards. However, both open screen and solid bottom boards saw over 90% drop in mite loads. Mesh floor/screen bottom boards should be closed off to prevent formic vapours from dumping out. Bees are not built to move air up through a screen, so open mesh floors should not be considered as additional ventilation. The bottom hive entrance must be fully open during treatment.

APPLICATION & PRODUCT SPECIFICS

WHY DO I NEED TO PLACE THE STRIPS ON TOP OF THE BOTTOM BROOD CHAMBER? WHY NOT THE TOP?

Formic Pro works as a fumigant in the hive and can most effectively penetrate brood caps, where mites reproduce, when strips are placed closest to the brood rearing zone.

THE LABEL SAYS TO AVOID DISTURBING THE COLONY AT TIME OF APPLICATION. CAN I DO A FULL COLONY EXAM AND THEN TREAT IMMEDIATELY, OR SHOULD I WAIT AND COME BACK TO TREAT?

The bees need to have their affairs in order at treatment time. When running trials, we discovered that the colony assessments were best done 3 days in advance of the application. If the colonies were taken apart, assessed, reassembled and then treated, we noted some absconding and an increased risk in queen loss. After an exam, it is best to wait at least 24 hours before applying Formic Pro.

Healthy Bees. Healthy Planet.

Head Office, Canada: NOD Apiary Products Ltd. PO Box 117, 2325 Frankford Road, Frankford, Ontario
T: +1 613-398-8422 • F: +1 613-398-0495 • E: info@nodglobal.com • www.nodglobal.com

FORMIC PRO – FAQs



NORTH AMERICAN

ON THE PRODUCT LABEL IT STATES: "THIS PRODUCT IS CORROSIVE. DO NOT ALLOW PRODUCT TO CONTACT METAL SURFACES." ARE THE STRIPS SAFE TO USE WITH METAL QUEEN EXCLUDERS?

Formic Acid vapours are corrosive to ferrous metals, but not to aluminum or most stainless steels. Some queen excluders get a white powder on them and will show rust around the edges over time. Plastic excluders are not affected.

WHY DOESN'T FORMIC PRO DEVELOP RESISTANCE?

Resistance Management: Mites are not expected to develop resistance to Formic Acid. Rotation with other miticides is not necessary. Formic Pro should not be used at the same time as other miticides.

HOW DOES FORMIC PRO PENETRATE BROOD CAPS?

Formic Pro is a brood treatment and because 80% of the mite population is found under the brood cap, the strips are placed directly on the top bars of the brood chamber, in the heart of the hive. While the bees fan the vapours, the formic acid molecules are small enough to penetrate the thin wax capping layer and the cocoon of the developing baby bee to reach the mites. Most other miticides kill phoretic mites on adult bees by contact. Bees must brush up against or walk over an impregnated strip or gel solution.

WHAT IS THE EFFICACY OF EXPIRED PRODUCT?

It is a violation of federal law to use expired product. When product expires, it does not lose efficacy, it loses its controlled release. The eco-paper wrap on the outside of the strips begins to breakdown and causes the formic vapours to be released faster, which can cause excessive brood, bee and queen loss. Please check expiry dates before purchasing and treating. Dispose of expired product per the label.

HONEY SUPERS & RESIDUE

CAN I TREAT WITH HONEY SUPERS ON? WHY DOES FORMIC PRO NOT LEAVE RESIDUE IN THE HONEY?

Formic acid is an organic acid that naturally occurs in honey. Formic Pro controls the vapour release of formic acid throughout the 7-day treatment period. By the end of treatment, formic acid levels in the hive reflect what naturally occurs in honey, when applied as per label.

DO I NEED AN EXTRA HONEY SUPER ON WHILE TREATING, OR CAN I TREAT WITHOUT ONE IN PLACE?

Healthy Bees. Healthy Planet.

Head Office, Canada: NOD Apiary Products Ltd. PO Box 117, 2325 Frankford Road, Frankford, Ontario
T: +1 613-398-8422 • F: +1 613-398-0495 • E: info@nodglobal.com • www.nodglobal.com

FORMIC PRO – FAQs



NORTH AMERICAN

No, you do not need to have a honey super on during treatment. However, it is recommended to place an empty honey super on the hive to give the bees room to expand the cluster. There is no loss in efficacy. It is also recommended when treating in late summer and early autumn, to treat while the last honey super is still in place.

FEED & FORAGE

WILL THE BEES CONTINUE TO FORAGE DURING THE TREATMENT?

Yes, the bees continue to forage.

CAN I FEED DURING TREATMENT?

No, feeding of any type that comes in contact with the hive (frame, hive-top feeder) is NOT recommended during treatment. Barrel feeding is acceptable. For optimal success with Formic Pro, ensure your bees are well nourished before treatment.

BROOD, BEES AND QUEEN HEALTH

WHAT IS THE IMPACT OF FORMIC PRO ON THE BROOD?

Any brood damage that occurs is quickly reversed as the queen is laying throughout the cluster area by day 7. There are often lots of eggs by day 4, and regular Formic Pro users note that queens lay throughout the treatment. The field bees continue to collect pollen throughout the treatment, so there are good protein reserves when the larvae need feeding. More brood mortality may be observed in colonies with high virus loads.

CAN I REDUCE THE DOSE?

In the USA, Formic Pro is registered with 2 treatment options, Option One: 14-day treatment and Option Two: 20-day treatment.

Option One: 14-day treatment

Lay two strips, staggering them so they lay flat and across the full width of the lower brood chamber, in the heart of the brood rearing zone, with approximately 2 inches between strips and 4 inches between the ends of the brood chamber and the outer edges of the strips. Follow the Application Options pictogram.

Healthy Bees. Healthy Planet.

Head Office, Canada: NOD Apiary Products Ltd. PO Box 117, 2325 Frankford Road, Frankford, Ontario
T: +1 613-398-8422 • F: +1 613-398-0495 • E: info@nodglobal.com • www.nodglobal.com

FORMIC PRO – FAQs



NORTH AMERICAN

Add a honey super with frames at time of application if necessary to provide adequate space for strong colonies to expand, or if a honey flow is expected. It is acceptable to have queen excluders in place.

Allow a minimum of one month between applications. Do not mix with other miticides.

Option Two: 20-day treatment

On Day+0: Lay one strip across the frames in the center of the lower brood chamber, in the heart of the brood rearing zone. Follow the Application Options pictogram.

Add a honey super with frames at time of application if necessary to provide adequate space for strong colonies to expand, or if a honey flow is expected. It is acceptable to have queen excluders in place.

On Day+10: Remove and replace with a second single strip. The application of the second strip may be delayed if weather conditions at day +10 do not allow for treatment. The second strip must be applied as soon as weather conditions permit to complete treatment.

No studies have been completed on nucleus colonies.

I'VE HEARD THERE CAN BE ISSUES WITH QUEEN HEALTH WHEN USING FORMIC ACID. IS THIS TRUE?

During dearth periods, when ambient temperatures are above 29.5°C (85°F), there is an elevated risk of queen loss, supercedure, or delay in egg laying. Treatment should be postponed until temperatures drop or nectar flow resumes. Formic acid will initially disturb colony activities and may, within one day of application, result in queen rejection or slight increase in adult bee mortality. Some brood mortality may occur in the initial stage of treatment.

Natural honey bee emergence and mortality rate is approximately 1,500 bees per day. A one-day equivalent of natural mortality (i.e. 1,200 to 1,500 bees or up to 2 cups) may be observed at the hive entrance during the treatment. Treatment may trigger supercedure of fragile queens, regardless of age.

Colony activity should return to normal by the end of treatment. Do not destroy queen cells that may be observed prior to, or post treatment. Supercedure, even if thought to be set in motion by treatment, is a natural process, and should be allowed to proceed for the health of the colony. Verify colonies are queen-right one month after treatment. Mother and daughter queens present post treatment is not uncommon.

COMMON OBSERVATIONS

Healthy Bees. Healthy Planet.

Head Office, Canada: NOD Apiary Products Ltd. PO Box 117, 2325 Frankford Road, Frankford, Ontario
T: +1 613-398-8422 • F: +1 613-398-0495 • E: info@nodglobal.com • www.nodglobal.com

FORMIC PRO – FAQs



NORTH AMERICAN

VIRUS LEVELS

Formic acid highlights pre-existing colony weaknesses. If mite levels exceed local economic thresholds, chances are the virus loads within the colonies are elevated. This can affect the queen's capacity to mitigate the treatment. By following an Integrated Pest Management (IPM) program, colonies can effectively manage mite levels and virus loads.

IT LOOKS LIKE MOST OF THE BEES ARE BEARDING OUT ON THE FRONT OF THE HIVE. IS THIS NORMAL?

It is normal for the bees to beard out for the first few days, especially under warmer conditions. See the University of Hawaii photos in their report from 2009, found at: <http://nodglobal.com/research-articles/>

To help prevent excessive bearding, add an empty honey super with frames to the top of the hive during treatment. This will give the bees space to move up, away from the strips, instead of out on the front of the hive.

I SEE SOME DEAD BEES AT THE ENTRANCE OF MY HIVE, WHAT IS HAPPENING?

Natural honey bee emergence and mortality rate is approximately 1,500 bees per day. A one-day equivalent of natural mortality (i.e. 1,200 to 1,500 bees or up to 2 cups) may be observed at the hive entrance during the treatment. Treatment may trigger supercedure of fragile queens, regardless of age.

IT STATES ON THE LABEL, SPENT STRIPS DO NOT NEED TO BE REMOVED AFTER TREATMENT. DO THE BEES EAT THE SPENT FORMIC PRO?

Honey bees do not eat the strips. Bees are simply carrying out their house cleaning activities by expelling pieces of the strips from the hive, which then naturally decompose in the environment. Strips can be removed from the hive at the beekeeper's convenience.

IS IT TRUE THAT STRONGER COLONIES SEEM TO HAVE MORE VARROA THAN WEAKER COLONIES?

Larger bee colonies have higher mite levels. The more bees, the more mites. Strong hives often rob weaker, varroa infested hives. If after treating with Formic Pro your strong hives still have a significant mite load, it may be an indicator your bees may be robbing out neighboring infested colonies.

Have proper mite load tests completed prior to treating. Post treatment, follow up with another mite level sampling to better understand efficacy and how much is needed to control the mites in your colonies.

Healthy Bees. Healthy Planet.

Head Office, Canada: NOD Apiary Products Ltd. PO Box 117, 2325 Frankford Road, Frankford, Ontario
T: +1 613-398-8422 • F: +1 613-398-0495 • E: info@nodglobal.com • www.nodglobal.com

FORMIC PRO – FAQs



NORTH AMERICAN

I JUST FINISHED TREATING BUT MY MITE DROP IS VERY HIGH, WHAT IS GOING ON?

Formic Pro works by penetrating the brood cap to kill mites where they reproduce. The majority of mites (80%) in a hive are found under the brood caps feeding on the developing bees. After a treatment, phoretic mites (mites found on adult bees) have dropped, however mites killed under the brood caps will drop as baby bees emerge from their cells. To get a more accurate mite count, wait a full brood cycle, or 16+ days after treatment.

DISPOSAL

THE BEES CHEWED UP SOME, BUT NOT ALL OF THE STRIPS. HOW DO I DISPOSE OF THE SPENT STRIPS?

The leftover spent strips will compost over time. They can be handled the same way as any other organic yard waste material. The strips can stay in the hive after day 7 as they are no longer releasing formic acid into the hive. The strips can be removed at the beekeeper's convenience, post treatment and composted.

I HAVE SOME UNUSED STRIPS; HOW AND WHERE DO I CORRECTLY DISPOSE OF THEM?

Unused strips need to be taken to your local hazardous waste facility.

For disposal of unused, unwanted, or damaged product: contact the manufacturer or the National Pesticide Information Center at 800-858-7378 (www.npic.orst.edu).

Healthy Bees. Healthy Planet.

Head Office, Canada: NOD Apiary Products Ltd. PO Box 117, 2325 Frankford Road, Frankford, Ontario
T: +1 613-398-8422 • F: +1 613-398-0495 • E: info@nodglobal.com • www.nodglobal.com