

DIRECTIONS FOR USE:

Unit of Packaging

Species: *Bombus impatiens* (Common Eastern Bumblebee)

Package: QUAD pollination unit containing four bumblebee hives each containing supplemental sugar water.

Contains: Each of the 4 hives contains approximately 150-200 workers, a reproductive queen, and developing brood (eggs, larvae, and pupae).

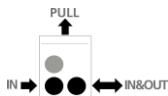
Introduction

Place QUADS evenly throughout the field. Use a pallet (do not stack)



Position the QUAD hive doors away from prevailing wind or protect with a wind guard.

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Place in field 5-10 days before bloom

Open the hive door of each hive by pulling the sliding door-up

Paper mesh covers the exit, the bees must chew this mesh to leave the QUAD. Do not remove this mesh.



The early morning sun is beneficial for warming the Quad and activating pollination, but when temperatures reach over 27°C (80°F), it is recommended to provide a shade structure over the unit to protect the hives from afternoon sun. This is not necessary for very spring flowering crops (haskap, apples). **Warning:** For blueberries, cranberries, squash crops, we recommend that the QUADS be shaded from the hot midday and afternoon sun. Either by using the shade of windbreak hedges or by making a shading structure (example: two pyramid-shaped pallets.)

Environmental



Precaution: Orient hive doors away from prevailing wind or use a wind guard

Bumblebees can be used in conjunction with honeybees but should be placed at least 100 meters from honeybee colonies to prevent honeybees from raiding the bumblebee nests.

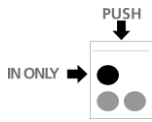


QUAD bumblebees perform best at ambient temperatures of 50-82°F (10-28°C).

QUAD units are attractive to large mammals such as bears. If bears are a concern, surround the QUAD units with electric fencing available from agricultural suppliers.

Moving the QUADS

QUAD units can be moved between fields. However, prior to moving the units to another location it is important to allow all bees to return to their hives.



QUADS can be moved by closing the door to the “in-only” position 24 hours prior to moving to the new location. Some bees are typically lost with each move.

Precaution: Use a bee suit if possible to move the QUADS

If you move the QUADS over long distances use a refrigerated truck at 15°C and renew the air every 3 hours. Night transport is desired.

Warning: Check with the local governments for regulations regarding the transportation and of moving bumblebees.

Chemical Usage

Bumblebees are susceptible to various chemicals as are other pollinators. Detailed information about chemical [side effects](#) and appropriate safety measures are available at Koppert.ca

Before using incompatible pesticides, hives must be closed and removed from the treated area. This should never last longer than 2 days, as the colonies will suffer from starvation and mortality of larvae due to lack of pollen.

FREQUENTLY ASKED QUESTIONS

When should I introduce QUADS to my field?

It is recommended to introduce into fields 5-10 days prior to first bloom. QUADS are designed to reach peak activity 2-3 weeks after delivery, so this introduction ensures peak activity matches peak bloom and also provides some buffer in event of transport stress. Typically, native pollen and nectar sources should be already open; dandelion, alder, willow, shepherds’ purse etc. well before earliest blooming crops (Blueberry, Haskap).

How much food is in the QUAD?

QUADS are shipped with sufficient pollen and sugar water to survive during transport. QUADS should be placed in the field and hive doors opened immediately upon arrival.

How should you handle QUADS upon receipt?

Most important is not to be rough with them (dropping, throwing them on pallets, etc.). Bumblebee colonies can be damaged by rough handling and can spend several days repairing the hive instead of pollinating your crops! QUADS should be introduced to the field and the doors opened as soon as they arrive. It is not necessary to cap the sugar water supply.

How long should QUADS pollinate for?

QUADs are designed to pollinate for 6-8 weeks.

What happens to the QUAD after 6 – 8 weeks?

After 6-8 weeks QUAD colonies switch to producing only queen and male bees, each new queen will mate then leave the QUAD to start a new colony. Dispose of the QUAD after pollination season. Bumblebees will not recolonize the old QUAD.

How should I dispose of old QUADS?

It is recommended that old QUADS be removed from the field and properly disposed of off-site or burned (in accordance with local regulations). Old bumblebee colonies can be a source of bee pests or diseases which could carry over to next year's QUADS or native pollinators.

What is the foraging range of the bumblebees?

Bumblebees can effectively forage up to 500 metres from the QUAD unit.

How do I protect my QUADS from Bears and other predators?

You can protect your QUADS from bears and other predators by placing them in an electric fence enclosure with sufficient voltage to ward off unwanted animals. If the QUADS need to be grouped together for electric fencing, it is recommended to group no more than 4-5 QUADS per enclosure. Do not stack QUADS.

How can I tell if my QUADS are working properly?

The best way to determine the performance of the colonies in a QUAD is by measuring the number of bees entering or exiting each colony over a 10-minute period. A colony (four colonies per QUAD) should be averaging a minimum of 1 enter/exit per minute under good flying conditions.

Can Ants hurt my QUADS?

Yes! Ants can be very disruptive to bumblebee colonies as they steal the bee's resources and divert hive energy to protecting the hive instead of foraging. The simplest way to control ants around your QUADS is by using Ant bait around the QUAD. Koppert also sells sticky tape that can be wrapped around the base – contact your local representative or 1-800-567-4195 for details.

Why are my bees not leaving the QUAD?

If flying conditions are ok and bees are not leaving the hive, it typically means the colony has been damaged in placement or shipping and the bees are busy doing repairs, typically this lasts no longer than three days. Please contact your Koppert representative if the lack of activity lasts longer than three days.

Why are there clusters of bees on the ground around my QUAD?

This is a normal occurrence and is either queens mating or newly mated queens starting new colonies.

Why are there dead bees in front of hive entrances?

Bumblebees throw any dead bees out the entrance, if you see a large amount of dead bees upon delivery, this may indicate a problem in the logistics chain. If this issue occurs after placement in the field, this may be a sign of pesticide poisoning from the crop or one nearby.

For additional information, please contact your local Koppert representative or call us at 1-800-567-4195.

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