

Nortica[®]

Deeply Rooted In Nematode Management

NORTICA HAS TURNED
NEMATODE MANAGEMENT
ON ITS HEAD.



Bayer

Nortica®

Deeply Rooted In Nematode Management

NOW YOU CAN HELP MANAGE NEMATODE PROBLEMS BEFORE THEY START.

Introducing Nortica® - Nortica contains a naturally-occurring active ingredient that protects turf roots from nematodes.



**ROOTS ARE HEALTHIER, MORE EFFICIENT
AND ROBUST IN THE PRESENCE OF NEMATODES.
YOUR TURF WILL SHOW THE RESULTS.**

NORTICA®. A FRESH APPROACH TO NEMATODE MANAGEMENT.

Nortica is revolutionary. It is the first biological product proven to protect turf against nematodes, while delivering exceptional benefits to the root system of golf course turf.

NORTICA IS ALIVE

Nortica is a biological agent that protects plant roots against parasitic nematodes in turf, lawns, sod farms, and golf courses (greens, tees, fairways and roughs). Nortica, which contains the bacteria *Bacillus firmus* (strain I-1582), is used to help manage nematodes by creating a living barrier of protection around the roots.

NEMATODES ARE SMALL BUT THE PROBLEMS THEY CAUSE ARE NOT

Nematodes are microscopic worms that feed on root systems and can cause serious damage to the root systems of turfgrass. With a damaged root system, turf weakens and can show a reduction in density, color, and overall quality as well as an increase in drought stress and susceptibility to disease. Symptoms of nematode damage include: weak turf, poor rooting, chlorosis, poor density, and an overall reduction on water and fertility efficiency.

NEMATODES CONTROLLED

Nortica is effective against the most common nematodes including:

- Sting
- Lance
- Root-Knot

Nortica also works against these secondary nematodes found in turf:

- Spiral
- Stunt
- Sheath
- Cyst

HOW NORTICA WORKS

EARLY SPRING APPLICATION:

Upon application, the *Bacillus firmus* spores in Nortica germinate to form reproductive, vegetative cells that colonize at the root surface. Nortica consumes the plant exudates that nematodes use for food. No food makes life very tough on nematodes and they go elsewhere. Meanwhile, the layer of protection formed around the root not only acts as protector, but induces production of a growth-promoting hormone that actually strengthens the root.

FALL APPLICATION:

The ideal time to resupply the soil with *Bacillus firmus* spores in Nortica is in the fall. Nortica will continue to protect roots and help reduce the fall emerging larval population, thus reducing the potential for an increase in spring surviving adult populations. Benefits will carry over until the next spring application is applied.

WHAT TO EXPECT

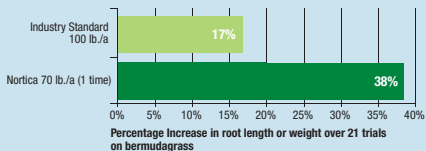
- Improved turf color, quality and density
- Improvement in root system size in infested areas
- Nematodes present but less active

THE PROOF BEHIND NORTICA® - IMPROVED ROOT GROWTH

Extensive trials were conducted from 2008 through 2011, comparing Nortica® with the industry standard in nematode control. All trials were applied on bermudagrass in Florida, Alabama and South Carolina. In all instances, Nortica consistently demonstrated the most improved root growth.

ROOT GROWTH

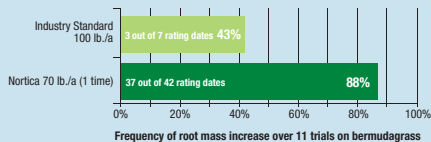
Percent Root Increase - bermudagrass with the application of Nortica and Industry Standard



Data from Crow, Cisar, Unruh, Guertall, Lawrence, Mixson, Faske, and Newman Trials: 2009-2011.

ROOT MASS

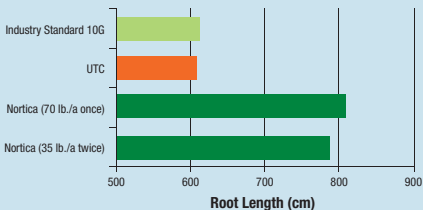
Frequency Root Increase versus UTC on bermudagrass with the application of Nortica or Industry Standard, 2009-2011



Change source note to *Data from Crow, Cisar, Unruh, Guertall, Lawrence, Mixson, Faske, and Newman Trials: 2009-2011.

ROOT LENGTH

Root Length on TifDwarf Bermudagrass Green - Billy Crow, University of Florida, 2010



PLUGS FROM UNTREATED AREA

PLUGS FROM AREA TREATED WITH NORTICA AT 70 lb./A

APPLICATION TIMING & RATE

APPLY SPRING & FALL

Due to the preventative nature of this product, application timing is critical. Nortica® should be applied initially in the late winter to early spring when root initiation is beginning in the turf and before nematode activity has peaked and then in the late summer to early fall to resupply the soil with *Bacillus firmus*. Application timing depends on the specific location. In trials, research showed that Nortica consistently improved root growth (depth), turf quality and turf density.

RATE

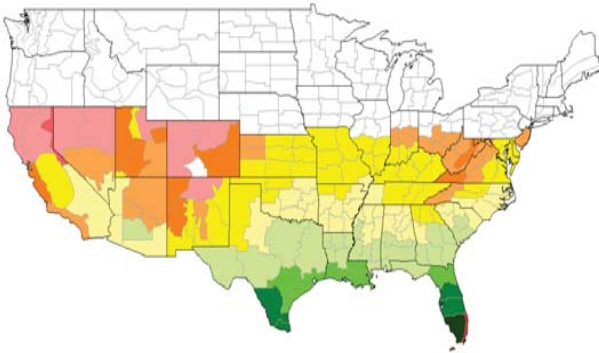
Apply 70 lbs. of Nortica per acre.

70 lbs. of Nortica delivers .25 lbs. of Nitrogen per 1,000 square feet.

TIMING

- Timing is based on growth models that predict when root expansion will occur. The concept is to apply Nortica at or during root expansion to protect newly developing roots from nematode damage.
- **SPRING:** Generally, spring application should not occur until the low air temperature reaches 60° F for 3 consecutive days.
- **FALL:** Fall applications should cease once the low temperatures consistently drop below 60° F.
- Review the zoned calendar map below as a general guideline for applying Nortica in your area.

NORTICA APPLICATION DATE GUIDELINES



SPRING		FALL
Earliest Application For Spring Treatment*		Latest Application For Fall Treatment*
Early February		Late November
Early March		Mid November
Early April		Early November
Late April		Late October
Early May		Mid October
Mid May		Early October
Late May		Mid September
Early June		Early September
Mid June		Not recommended
Late June		Not recommended
Mid January		Late December

Visit the www.BackedbyBayer.com/Nortica website to see nematode activity forecast for the current year based on NOAA weather forecast. The maps will give you the best timing for your application. The maps will also show when Nortica applications should not be applied. Nortica is not registered in HI, AK, CA, IL and NY.

ADDITIONAL APPLICATION GUIDELINES

SPRAY EQUIPMENT GUIDELINES

- Minimum spray volume - 88 GPA (2 gallons per 1,000 square feet)
- Nozzle type and size - Utilize spray tips that will produce a uniform, coarse spray droplet that minimizes drift.
- Ensure spray tank is clean and has been properly rinsed.

APPLICATION GUIDELINES

MIXING

- Nortica® is a WP formulation
- Add water to the spray tank to half full
- Turn on agitation
- Add Nortica
- Nortica will dissolve in water
- Add remaining water while agitating
- Spray after Nortica has dissolved in solution
- Irrigate immediately after application to move product in the top 1"-4" of the root zone

CAN OTHER PRODUCTS BE ADDED TO THE SPRAY TANK WITH NORTICA?

Do not mix Nortica with other chemicals or fertilizers during application.

Do not apply within two weeks of a fumigant application.

No other spray adjuvants are needed.

CAN SPRAY SOLUTIONS STAY IN THE TANK FOR EXTENDED PERIODS?

Do not allow spray solution to stay in sprayer for more than 24 hours.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks
- Dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95, or P-95

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

IRRIGATION REQUIREMENTS

Irrigate immediately to thoroughly incorporate Nortica into the upper soil profile.

At a minimum, irrigate with 0.1" to 0.2" of water to move Nortica from the grass blades into the soil.

Continue normal irrigation practice as needed, product should reach the root zone.

RE-ENTRY INTERVAL

Re-entry can occur once the spray has dried.

APPLICATIONS NEAR WATER

Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark.

BEAT NEMATODES AT THE ROOT OF THE PROBLEM

Why wait for nematodes to cause damage? Now you can help manage nematode problems before they start. To learn more, visit BackedByBayer.com/Nortica.