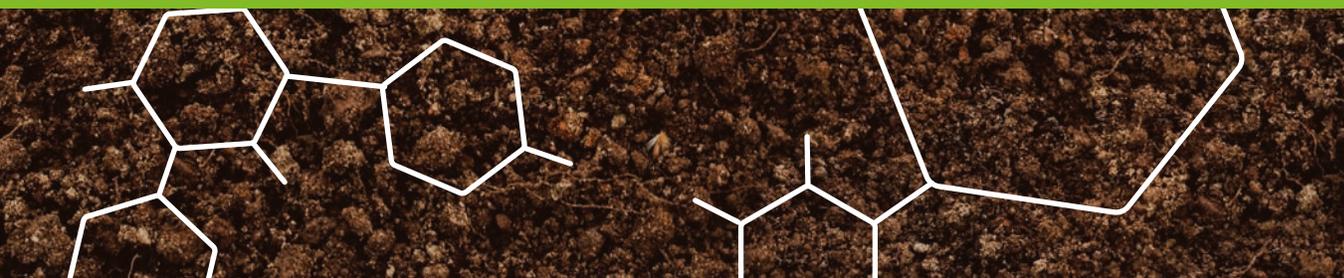


LOOKS LIKE ART

**GROUNDED IN
SCIENCE**

— SYNGENTA PLANT GROWTH REGULATORS —

syngenta[®]





LOOKS LIKE ART

IF YOUR COURSE IS A CANVAS, then Primo Maxx® and Trimmit® 2SC plant growth regulators are two very important tools on your palette. Using plant growth regulators (PGRs) like Primo Maxx and Trimmit can be an art—they have many uses, and how you use them reflects your desired outcome. However, unlike art, the quality of your turf is less subjective, and consistent, superior performance is vital. Syngenta has researched and expertly recommended the use of PGRs for years to provide you with the results you need time and time again.

● IMPROVE TURF QUALITY

BOOST AESTHETICS

The aesthetics of your course are the first thing players notice. To help your course make a great first impression, Primo Maxx and Trimmit can visually enhance your turf by:

- Developing greener turf from reduced leaf elongation, concentrating chlorophyll in smaller blades
- Making mowing patterns more pronounced with bold color
- Increasing the density and visual quality of the turf

ENHANCE PLAYABILITY

If aesthetics are the first thing golfers notice, playability is what keeps them coming back. Golfers' demand for faster greens has meant mowing them ever shorter, which can lead to stressed turf and inconsistent turf performance. Primo Maxx and Trimmit help increase turf density, improve stress tolerance and optimize playability on greens, tees and fairways by:

- Allowing flexibility in mowing heights and higher fertility for turf health while preserving desirable putting speed
- Maintaining more consistent putting speed throughout the day
- Allowing the ball to sit higher on fairways, thus improving the lie, and reducing leaf blades between golf ball and club face

I have been using both Trimmit and Primo Maxx at Kirtland Country Club for 12 years – they are the foundation of our program. Primo Maxx helps us to meet the increasing demand for faster green speeds and keeps those speeds consistent throughout the day, while Trimmit regulates growth and controls *Poa annua* on our bentgrass fairways. **Using a Trimmit program, we have seen our fairways go from 60% *Poa annua* to predominately bentgrass without seeding.** As a superintendent, I work in a climate where I need to do more with less, and Trimmit and Primo Maxx help me to do that.

CHAD MARK

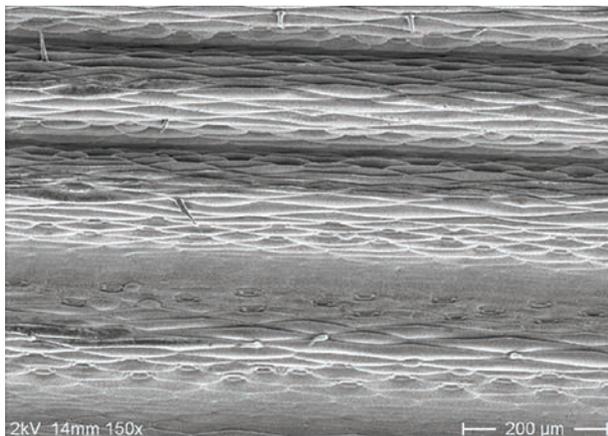
Superintendent, Kirtland Country Club, Willoughby, Ohio

GROUNDING IN SCIENCE

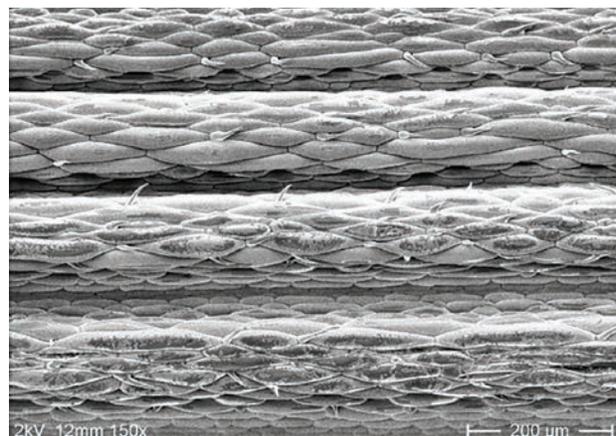
HOW IT WORKS

Primo Maxx and Trimmit slow turf growth and improve turf quality by inhibiting gibberellic acid (GA), the plant hormone responsible for cell elongation. This leads to more compact cells and higher chlorophyll content for enhanced photosynthetic activity (see images below). The active ingredient in Trimmit, *paclobutrazol*, is an early-stage GA synthesis blocker and *trinexapac-ethyl*, the active ingredient in Primo Maxx, is a late-stage GA synthesis blocker. On many turf sites these different modes of action are complementary and a tank mix of Primo Maxx and Trimmit can yield even greater results.

UNTREATED



PRIMO MAXX



Scanning Electron Microscopy: Cell Length (adaxial surface), Syngenta Research, Jealott's Hill, United Kingdom



Poa annua control with Trimmit in a creeping bentgrass putting green

SUPPRESS POA ANNUA

Poa annua is a nemesis for many courses. Seedheads both mar the appearance of the course and disrupt the playability of the turf.

- *Poa annua* is especially sensitive to Trimmit, and by slowing its vertical growth, desirable turfgrasses can crowd out *Poa annua*.
- Trimmit is an important part of the **GreenTrust™ 365 *Poa annua* Assurance Program** for overseeded fairways. Using Trimmit with Barricade® herbicide provides both pre- and post-emergent protection to control at least 90% of *Poa annua*.
- If *Poa annua* seedheads are your focus, a tank mix of Primo Maxx and Proxy® herbicide is an excellent combination on both greens and fairways.

IMPROVE PRE-STRESS CONDITIONING



STRONGER TURF

Primo Maxx and Trimmit also strengthen plants, which allow them to manage and recover better from biotic and abiotic stress. Key benefits include:

- Fortified root system and increased tensile strength (how the turf holds together)
- Improved resistance to various stresses such as drought, shade and foot traffic
- Fast divot and aerification recovery
- Reduced scalping by slowing turf growth, important when mowing schedules are disrupted by events such as heavy or extended rainfall



ENHANCED FUNGICIDE PERFORMANCE

Slowed turf growth means fewer clippings and/or less mowing time. In turn, fewer clippings allows previously applied contact and systemic fungicides to remain active in the turf longer, without being mowed off.



MORE EFFICIENT WATER USE

Research reveals that Primo Maxx can increase the efficiency of water utilization by the plant by 10 to 20%. Treated turf is able to retain water longer, thereby increasing its resistance to stresses such as heat and drought, and reducing the irrigation required to maintain it. Primo Maxx helps accomplish this by:

- Producing smaller leaves with less surface area for transpiration
- Improving rooting for access to deeper soil moisture
- Promoting turf density, which reduces water loss from soil surface evaporation
- Reducing GA production, which aids stomatal regulation



IMPROVED SHADE TOLERANCE

Turf growing in shade becomes taller and weaker, due to an increase in GA (gibberellic acid). Primo Maxx and Trimmit slow the production of this acid, helping to increase turf density.

PRE-DROUGHT CONDITIONING WITH PRIMO MAXX

Some seasons hit your turf harder than others. Fortunately, pre-conditioning with Primo Maxx can prepare turfgrass for extreme conditions before they develop. Research has proven that applications of Primo Maxx made prior to the onset of stresses such as heat, drought and traffic can strengthen the turf, and enable it to withstand ongoing stresses throughout the season.

- Turf is naturally inefficient in its water use. In fact, according to a study from Rutgers University, approximately 90% of the water absorbed by turfgrass is transpired and only about 3% is used for photosynthesis.¹
- One of the many benefits of Primo Maxx is its positive effect on transpiration in turf. Turf is able to retain more of the water it absorbs and better resist abiotic stresses like heat and drought.
- Water efficiency in turf can be even further enhanced by using Primo Maxx in combination with Daconil Action™ and Heritage Action™ fungicides, which use *acibenzolar-S-methyl* to aid in the regulation of stomata, the plant's gateway for gas exchange.

EFFECTS OF PRE-DROUGHT CONDITIONING WITH PRIMO MAXX ON BENTGRASS



WITHOUT PRE-CONDITIONING
AND THEN SUBJECTED TO
DROUGHT/HEAT STRESS



SUBJECTED TO DEFICIT
IRRIGATION AND THEN
SUBJECTED TO
DROUGHT/HEAT STRESS



CONTROL WITHOUT
DROUGHT/HEAT STRESS



PRE-CONDITIONED WITH PRIMO
MAXX AND THEN SUBJECTED
TO DROUGHT/HEAT STRESS

¹ Effects of Primo Maxx on Water Use and Drought Tolerance of Bentgrass Species, Dr. Bingru Huang, Rutgers University, 2007

CONSERVE VALUABLE RESOURCES



SAVE TIME

It's the primary benefit you expect from a PGR—slower growth. Primo Maxx and Trimmit can reduce turf growth by up to 50%, and less growth means less time mowing.

- Less growth means fewer clippings, and less time spent disposing of them
- Mowing operations can be finished more quickly because clippings may not need to be caught
- Clipping clean-up is not needed
- More time for your staff to spend on other tasks



PRESERVE YOUR EQUIPMENT

When there's less mowing, there's less wear on reels, bed knives and other parts of your equipment, so your equipment is likely to last longer. Plus, less mowing means more fuel savings.

CLIPPING PRODUCTION COMPARISON ON TIFWAY 419 BERMUDA

photos taken August, 2015, 13 days after application on a 21 day application schedule



TANK MIXING PRIMO MAXX AND TRIMMIT COMPLEMENTARY MODES OF ACTION

Primo Maxx and Trimmit have different sites of activity in the GA synthesis pathway which, in some situations, complement each other when used together. *Trinexapac-ethyl* is foliar absorbed, so Primo Maxx will begin to affect the plant first. Conversely, *paclobutrazol* is primarily absorbed through the roots, so growth regulation is delayed, meaning Trimmit will pick up where Primo Maxx left off, adding longevity to the growth regulation effects.

FLEXIBILITY TO MIX YOUR WAY

Premixes of these two active ingredients are available, but they confine you to one ratio. By tank mixing Primo Maxx and Trimmit, you can customize the ideal ratio for the results you need on greens, tees, fairways and roughs.

SOME SITES THAT BENEFIT FROM A TANK MIX OF PRIMO MAXX AND TRIMMIT INCLUDE:

POA ANNUA/ BENTGRASS GREENS

Mixing a low rate of Trimmit with Primo Maxx offers enhanced *Poa annua* maintenance and adds longevity to the growth regulation effects of Primo Maxx.

BENTGRASS GREENS

Mixing a higher rate of Trimmit with Primo Maxx provides enhanced *Poa annua* control, enhanced soil residual and adds longevity to the growth regulation effects of Primo Maxx.

AREAS AFFECTED BY BACTERIAL ETIOLATION

Trimmit works to control leaf blade etiolation caused by *Xanthomonas* and *Acidovorax* pathogens while Primo Maxx helps maintain turf quality.

HYBRID BERMUDAGRASS FAIRWAYS & TEES

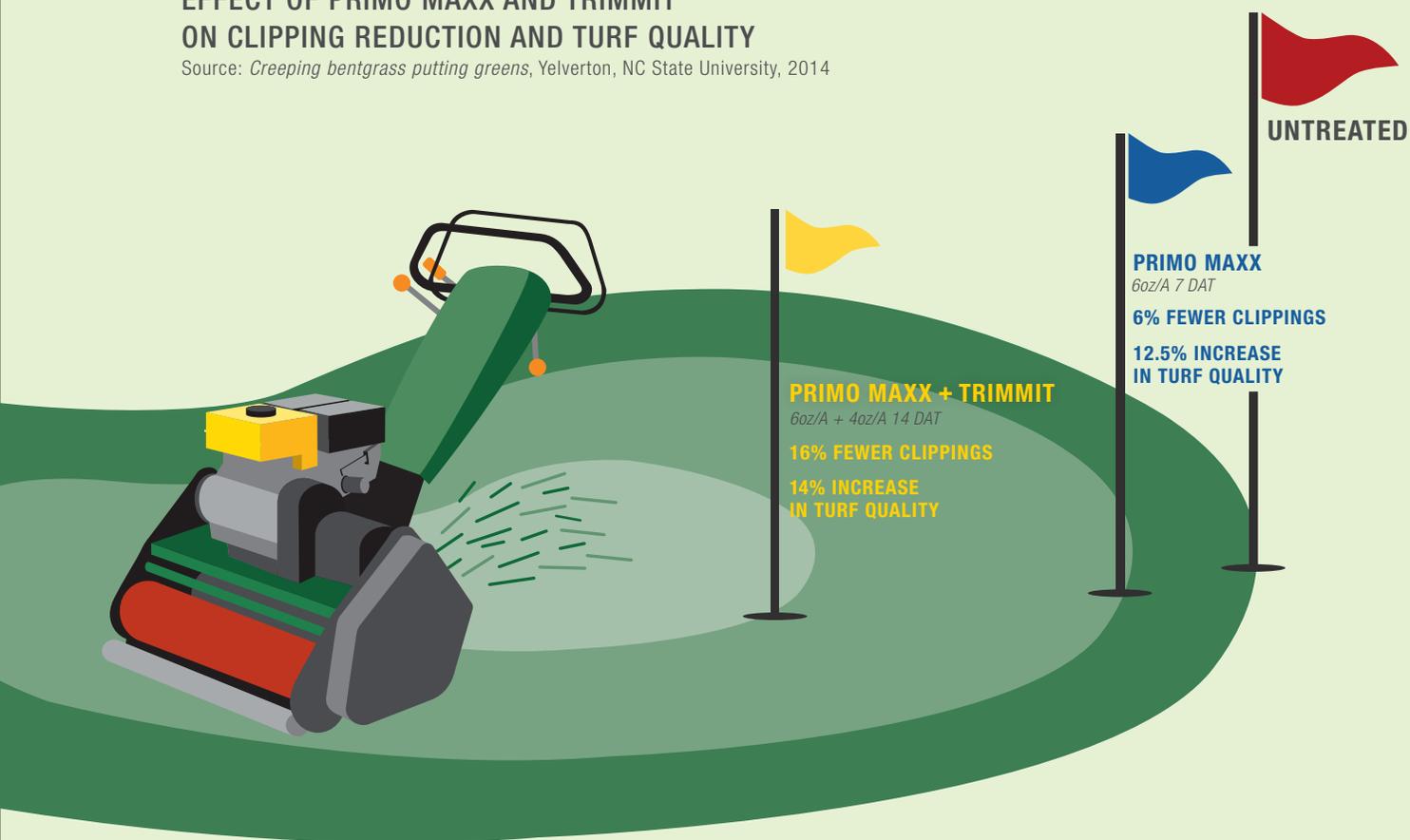
Mixing with Trimmit provides enhanced soil residual and adds longevity to the growth regulation effects of Primo Maxx.

GREATER CLIPPING REDUCTION BY TANK MIXING

On sites where appropriate, a tank mix of Primo Maxx and Trimmit can provide the maximum reduction in clippings. Because of their complementary activity, Primo Maxx and Trimmit may achieve better results when used together (see diagram below).

EFFECT OF PRIMO MAXX AND TRIMITT ON CLIPPING REDUCTION AND TURF QUALITY

Source: *Creeping bentgrass putting greens*, Yelverton, NC State University, 2014



WHEN NOT TO MIX

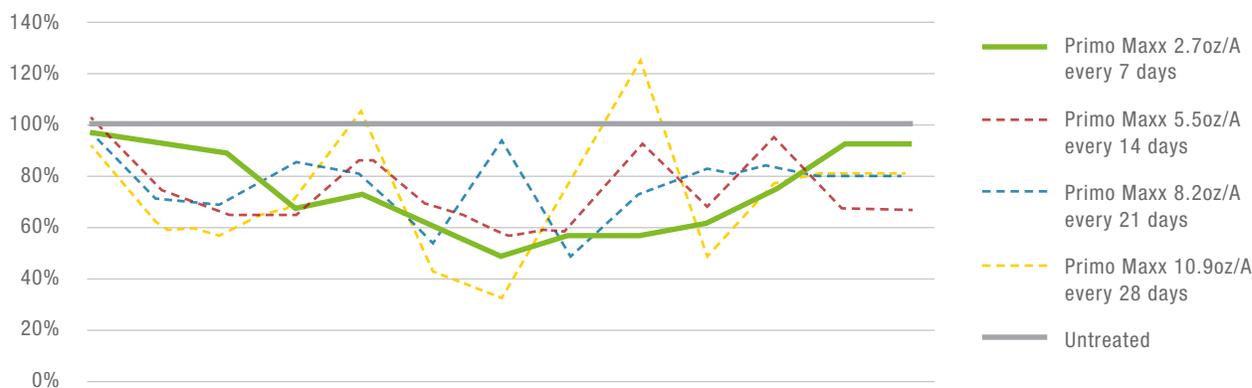
Though often an effective combination, there are instances when using Primo Maxx and Trimmit together is not recommended. For example, if your goal is to control *Poa annua*, Trimmit is typically the only PGR necessary. Whereas if your aim is to grow *Poa annua*, Primo Maxx is the product of choice. To suppress seedheads, a tank mix of Primo Maxx and Proxy is recommended.

LOWER RATES, HIGHER FREQUENCY

Because Primo Maxx is absorbed by the foliage, it does not leave significant soil residual. So when using Primo Maxx alone, the most consistent turf growth regulation can be achieved by applying lower rates, more frequently.

As illustrated by the chart below, lower application rates of Primo Maxx on a 7 to 14 day schedule produce more consistent relative clipping reduction, meaning more consistent growth regulation. The 100% line represents the clipping production of untreated turf. All treatments applied the same total amount of Primo Maxx for the season.

RELATIVE CLIPPING PRODUCTION BASED ON APPLICATION RATE & FREQUENCY



Creeping bentgrass fairway, Iowa State, 2012

"I've been using Trimmit for about 15 years, and more recently I have started tank mixing it with Primo Maxx. The mixture provides great *Poa annua* control, not to mention impressive growth regulation. Even during the rainy months, **I'M ABLE TO GO TEN DAYS WITHOUT MOWING MY FAIRWAYS.** My general manager told me that our turf performance is so consistent, he couldn't tell the difference between the days I mow and the days I don't."

JOHN THOMPSON

Superintendent, Sycamore Hills Golf Club, Fort Wayne, Ind.

For more information about how to increase your turf quality using Primo Maxx and Trimmit, visit GreenCastOnline.com or contact your local Syngenta territory manager.

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[#PrimoMaxx](#) [#Trimmit](#)

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2(ee): Trimmit 2SC Tank Mixed with Primo Maxx for Growth Suppression of Turfgrasses on Greens, Tees, Fairways, and Roughs in AL, AR, AZ, CA, CO, CT, DC, DE, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, MT, NC, ND, NE, NH, NJ, NM, NV, OH, OK, PA, RI, SC, SD, TN, UT, VA, VT, WA, WI, WV, WY.