

PHOTO 3



Etiolated perennial ryegrass leaf blade.
(Photo by Mike Fidanza)

ing-out” turf appearance with a combination of etiolated leaf blades and collapse of surrounding tillers thinning out in patches or at random leading, and thus severe and necrotic turf damage. Low light conditions may not be the only reason for ETS, since symptoms have been observed in both shaded and full-sun areas on fairways, roughs, greens, green collars and approaches and tees.

In general, ETS has been observed mostly on perennial ryegrass, creeping bentgrass and occasionally on annual bluegrass. ETS has been observed in turf treated with PGRs, and turf not treated with any PGR.

Upon close inspection, several organisms have been isolated from affected turfgrass: *Fusarium* sp., *Rhizoctonia* sp., bacteria (unknown sp.), *Ascochyta* sp., *Leptosphaerulina* sp., *Dreschlera* sp., and *Pythium* sp. The role these organisms play on ETS is not clear. Recently reported in New Zealand, the appearance of etiolated leaf blades in turfgrass was called “mad tiller disease” (Stewart). Fungi isolated from affected tillers of ryegrass in New Zealand included *Fusarium*

culmorum, *Fusarium crookwellense* and *Rhizoctonia solani* (Stewart). Although these fungi cause foliar, crown and root diseases in plants, many *Fusarium* fungi also produce plant growth hormones called gibberellins (Agrios, Ios). Japanese farmers will occasionally find an elongated rice plant, which they call bakanae or “foolish seedling” disease, where the extended tiller becomes yellowish and necrotic and then dies. In rice, this disease is caused by the fungus *Fusarium moniliforme*, which also is known to produce gibberellins (Desjardins, Sun). At this time, it is unknown if ETS is related to “foolish seedling” disease of turf.

What exactly is the cause of ETS in turfgrass? Several hypotheses are being investigated. The appearance of etiolated leaf blades is most likely due to excessive amounts of gibberellins perhaps accumulating in meristematic plant tissue. This over-production of gibberellins could be the plant’s defensive reaction to colonization of xylem tissue by bacterial or fungal species that might or might not be pathogenic to the turfgrass plant. Some bacterial and fungal organisms that potentially are primary or secondary invaders of turfgrass are known to produce gibberellins themselves, which can indirectly contribute to the elongation of the newest leaf blade (Taiz). The relationship of turfgrass maintenance practices and ETS is also being investigated. Should this condition be labeled a plant disease, or is this some plant physiological disorder?

Research is needed to answer these questions.

What can be done to control ETS or mad tiller symptoms in turf? Even though the exact cause of ETS is not decisively known at this time, fungicides and plant growth regulators commonly applied to fairway turf in summer maintenance programs have been evaluated in field studies in 2004, 2005 and 2006. The objective was to evaluate any potential association with ETS and plant protection products, including fungicides and PGRs.

Note: Fungicides and PGRs are not labeled for the management or control of etiolated tillers in turfgrass. The field studies were con-

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QUICK TIP

The EPA’s list of Integrated Pest Management (IPM) principles does not reference fertilizers, but rather focuses only on insects and diseases. However, the IPM guidelines can also be applied to fertilizers. Unnecessarily over-applying fertilizers can be compared to the unwarranted application of an insecticide when pest populations are too low to affect turf quality. As with pesticides, leaching caused by excessive fertilizer use is an environmental concern. Therefore, proper judgment must be used to determine if the plant requires a fertilizer application. Soil and tissue testing are useful tools that can help you make these critical fertilizer decisions.

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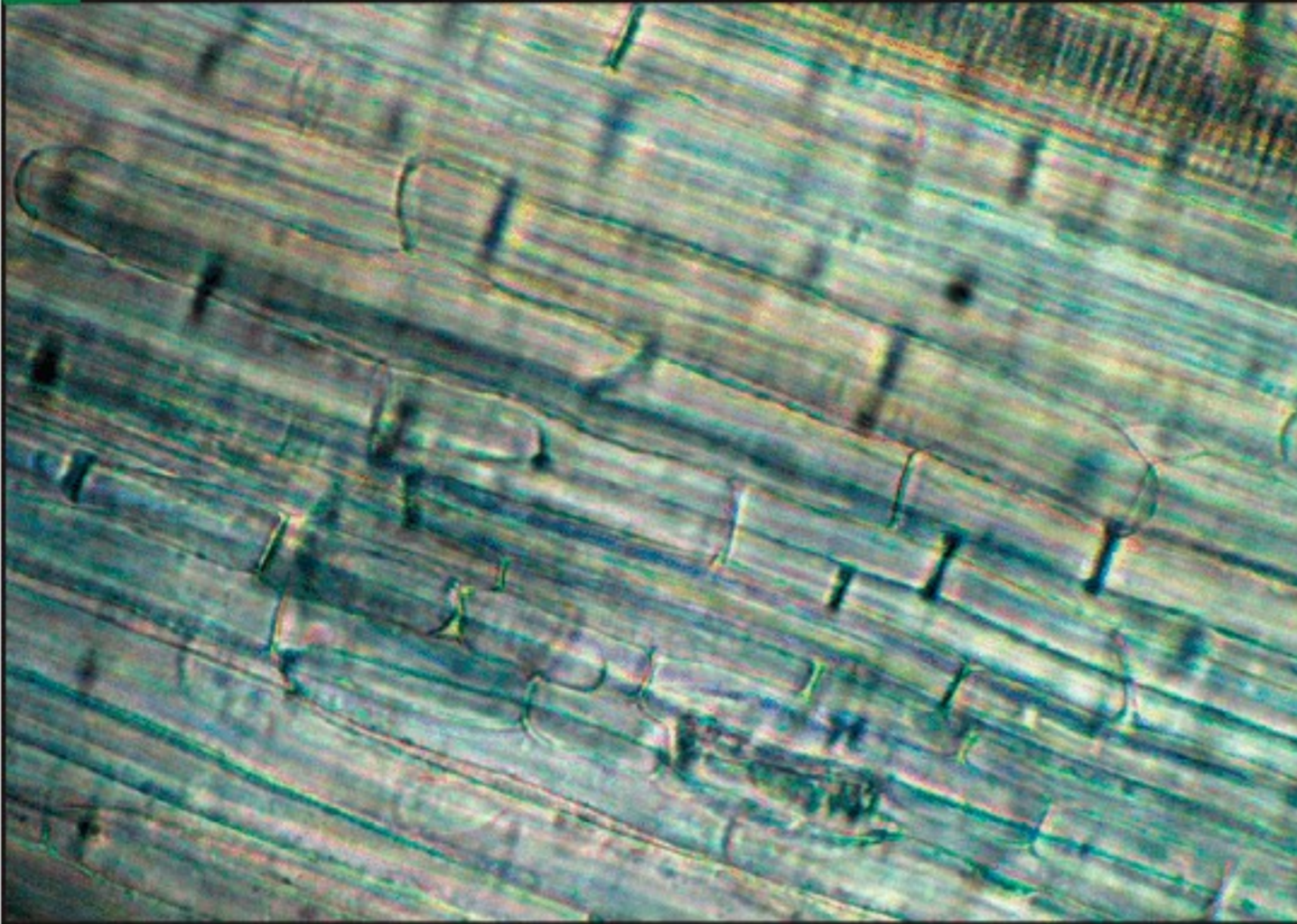
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PHOTO 4



Microscopic view of elongated cells from an etiolated perennial ryegrass leaf blade. (Photo by Jeff Gregos)



Bayer Environmental Science

QUICK TIP

Put *Poa* in its place this fall! Prograss herbicide eliminates *Poa annua* in perennial ryegrass, Kentucky bluegrass, creeping bentgrass and turf-type tall fescue. Because rates and number of applications vary with the tolerance of the desirable turfgrasses, superintendents should gain experience with Prograss by testing selected areas before application. Remember: Turf at its optimum level of fertility better tolerates Prograss, allowing desirable grass to fill in when *Poa* is controlled.

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ducted on a perennial ryegrass fairway with a history of ETS at Lebanon County Club. In 2004 and 2006, the actual number of etiolated tillers were counted per plot. In 2005, an estimate of the percent plot area affected with etiolated tillers was visually determined due to the severe amount of etiolation.

Overall, a noticeable reduction in the visual appearance of ETS was observed in plots treated with fungicides that contain an active ingredient of a demethylation inhibitor. A reduction in ETS was also observed in plots treated with the PGR products, which were only included in that 2005 field study.

REFERENCES

1. Agrios, G.N. 1978. Plant Pathology. 2nd ed. Academic Press, Orlando, FL.
2. Desjardins, A.E., H.K. Manandhar, R.D. Platter, G.G. Manandhar, S.M. Poling, and C.M. Maragos. 2000. Fusarium species from Nepalese rice and production of mycotoxins and gibberellic acid by selected species. Applied and Environmental Microbiology 66:1020-1025.
3. Ios, R., A. belhadj, M. Menez, and A. Faure. 2005. The effects of fungicides on Fusarium spp. and Microdochium nivale and their associated trichothecene mycotoxins in French naturally-infested cereal grains. Crop Protection 24:894-902.
4. McMahon, M.J., A.M. Kofranek, and V.E. Rubatzky. 2002. Hartmann's Plant Science: Growth, Development, and Utilization of Cultivated Plants. 3rd ed. Prentice Hall, Upper Saddle River, NJ.
5. Salisbury, F.B. and C.W. Ross. 1985. Plant Physiology. 3rd ed. Wadsworth Publishing Company, Belmont, CA.
6. Stewart, A. 2002. Mad tiller disease: a common but only recently named condition in turf. New Zealand Turf Management Journal. 17(8):25-26.
7. Sun, S.K. and W.C. Snyder. 1981. The bakanae disease of the rice plant. p. 104-113. In: P.E. Nelson, T.A. Toussoun, and R.J. Cook (ed.) Fusarium: diseases, biology, and taxonomy. The Pennsylvania State University Press, University Park, PA.
8. Taiz, L. and E. Zeiger. 1991. Plant Physiology. Benjamin/Cummings Publishing Company, Redwood City, CA.

Most all other fungicides tested had no effect or influence on the incidence of ETS in those perennial ryegrass field studies.

Although a few plant protection products show promise for helping to manage ETS, the cost of using those products could be a challenge to golf course superintendents. Therefore, more field testing and plant physiology-based greenhouse and laboratory research is warranted to fully understand ETS in turfgrass. For now, the cautious use of PGRs with frequent mowing helps to minimize the visual appearance of ETS, especially those elongated leaf blades.

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Out of Bounds

SOMETHING COMPLETELY DIFFERENT

iPod touch

In one of my favorite “Saturday Night Live” skits, Christopher Walken plays a music producer for 1970s heavies Blue Oyster Cult. The band works on its classic “(Don’t Fear) The Reaper,” and Walken says the song needs “a little more cowbell.” As the skit progresses, Will Ferrell, playing the fictional cowbell player, bounds across the stage, crashing into his bandmates. Walken then stops the insanity, only to begin it again by deadpanning, “Guess what?! I’ve got a fever, and the only prescription ... is more cowbell!”

Over the years, I have always chuckled at that one guy (or girl) on stage either playing tambourine or cowbell and wondered what cut of the band’s money that player receives. And, in a rather ironic nod to things so bad they’re good (“Attack of the Killer Tomatoes,” “Death Race 2000,” Twisted Sister, “Knight Rider”), I have come to embrace both the concept and the execution of the cowbell.

Imagine my surprise when, while playing around with a new iPod touch — basically an iPhone without the phone — I discovered an application called “More Cowbell.” At any moment during a song, you tap the icon, a cowbell fills the screen and, well, play that sucker.

NOW YOU CAN ADD MORE COWBELL
TO YOUR FAVORITE SONGS

BY MARK LUCE

I got the iPod touch back in August. It was basically a way to waste an Apple Store Gift Card, but I am now a full-fledged fan of this little device that has 16 times the memory of the laptop I had when I first started writing this column a decade ago.

The only difference, really, between a touch and an iPhone is that you can call people with the phone — assuming you don’t mind paying \$200 for the phone and 70-some bucks a month for two years of service. With the touch you can surf the Web, check your e-mail, keep a calendar, watch funny YouTube videos, get directions, watch a movie ... you get the idea. The only thing you need is a wireless signal, which you can increasingly find for free all over cities.

You might protest, “This is just an iPod.” Yes, on some level, it is just an iPod, but it has a touch screen that turns when you turn it. So, instead of searching for albums by name, turn the thing sideways to look at album



covers of your music, then start dragging your finger across the screen. Go from The Cure to Ike Turner to Ray Charles to Tom Waits to Ella Fitzgerald in seconds, but with the added aesthetic of a kaleidoscopic version of your music library. I’ve used the thing to store my son’s soccer pictures, to check the weather and to take attendance in high school art history class. And, yes, to listen to that super ’70s song by the band Sweet, “Fox on the Run.”

It’s not that the iPod touch is that different from any other mp3 player. But the touch is, to be perfectly honest, much cooler than any personal electronic device I’ve ever come across.

In short, the iPod touch has more cowbell.

Mark Luce lives in Kansas City, Mo., where he makes music playlists for domestic chores. E-mail him at msluce@everestkc.net.

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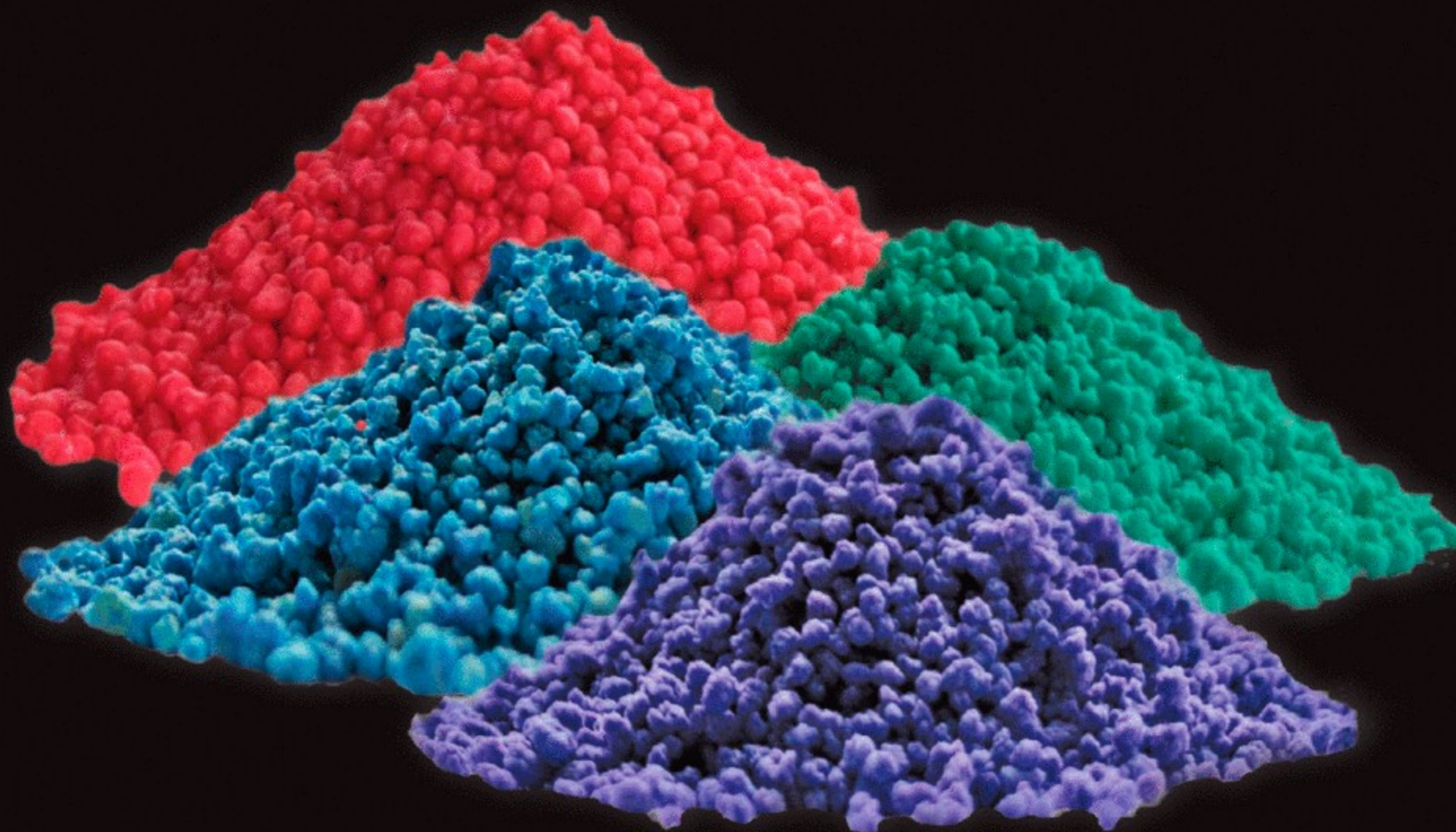


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