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Prevalent Purple Plants Perennially Puzzle Producers

Dr. Bob Nielsen, Extension Corn Specialist, Purdue University

Like the swallows that return every year to San Juan Capistrano, it seems that purpling in young corn returns every year somewhere in Indiana. In recent days, I have received several reports of purpling from widely scattered areas of the state. While mildly attractive from an ornamental standpoint, landlords and tenants alike often become concerned when they see their fields take on a purplish hue that is clearly evident from the window of the pickup at 60 mph.

Biochemical Cause of Purpling. Purpling of corn plant tissue results from the formation of reddish-purple anthocyanin pigments that occur in the form of water-soluble cyanidin glucosides or pelargonidin glucosides (Kim, 1998). A hybrid's genetic makeup greatly determines whether corn plants are able to produce anthocyanin. A hybrid may have none, one, or many genes that can trigger production of anthocyanin. That is the reason why purpling may appear in only one of two hybrids planted in the same field. Purpling can also appear in the silks, anthers and even coleoptile tips of a corn plant.

Agronomic Cause of Purpling. Well, you may say, that's fine but what triggers the production of the anthocyanin pigments in young corn at this time of year? The answer is not clearly understood, but most agree that these pigments develop in young plants in direct response to a number of stresses that limit the plants' ability to fully utilize the photosynthates produced during the day.

It has been my experience that the most common contributor to the development of purple corn plants is the combination of bright, sunny days and cool nights (40's to 50's° F) when corn plants are in the V3 to V6 stages of development (3- to 6-leaf collar stages). This combination translates to a lot of photosynthate produced during the day, but low rates of photosynthate metabolism during the night, that results in high concentrations of sugary photosynthates in the leaves. Since the anthocyanin occurs in the form of a sugar-



Rows of purple-leafed corn; late V3 stage of development

Cont. pg. 2



Hybrid differences for purpling; both plants V3

containing glucoside, the availability of high concentrations of sugar in the leaves (photosynthesis during bright, sunny days) encourages the pigment formation.

Hybrids with more anthocyanin-producing genes will purple more greatly than those with fewer “purpling” genes. In most cases, the purpling will slowly disappear as temperatures warm and the plants transition into the rapid growth phase (post-V6).

Other stresses that can restrict photosynthate metabolism in young corn plants include several that result in restricted root growth, including herbicide injury, severe phosphorus deficiency, soil compaction caused by tillage or planter traffic, excessively wet soils, excessively dry soils, insect injury, and disease injury. The negative effects of such root stresses on photosynthate metabolism can amplify

the intensity of the purpling already triggered by a combination of cool nights and bright, sunny days.

What About Yield Losses? Does the leaf purpling lead to yield losses later on? It is important to recognize that the cause of leaf purpling, not the purpling itself, will determine whether yield loss will occur.

If the main cause is simply the combination of bright, sunny days and cool nights, then the purpling will disappear as the plants develop further, with no effects on yield. If the major contributor to the purpling is restricted root systems, then the potential effects on yield will depend on whether the root restriction is temporary (e.g., cool temperatures & wet soils) or more prolonged (e.g., soil compaction, herbicide injury). Plants can recover from temporary



Hybrid differences for purpling

root restrictions with little to no effect on yield. If the root stress lingers longer, the purpling may continue for some time and some yield loss may result if the plants become stunted.

If the primary cause is hybrid response to the combination of cool nights and bright, sunny days, the purpling symptoms will be spatially uniform throughout a field. If other stress factors are also restricting root development and/or function, then the purpling symptoms may be spatially variable throughout the field and correlated to soil type, drainage characteristics, or elevation of the landscape. Spatially variable patterns of purple corn may indicate the potential for lingering, yield-limiting stresses that should be more thoroughly investigated.

Managing Volunteer Roundup-Ready Corn in a Corn Replant Situation

Dr. Ronald L. Ritter, Extension Weed Control Specialist, Emeritus

Every year I get questions regarding the control of a stand of Roundup-Ready corn where you have to replant. In that regard, a number of years ago, we looked at a number of herbicide programs for the con-

trol of volunteer Roundup-Ready corn when you had to replant. We made herbicide applications to corn plants that were 1 to 3 inches tall, and applied similar applications to corn that was 4 to 6 inches tall. Best

control was achieved when applications were made to the taller plants. All of the following treatments were equally effective in providing close to 100% control of the volunteer, Roundup-Ready corn plants.

- Gramoxone at 2 pints/acre + crop oil concentrate at 1% v/v
 - Gramoxone at 2 pints/acre + Sencor 75DF at 2 ounces/acre + crop oil concentrate at 1% v/v
 - Gramoxone at 1.5 pints/acre + Sencor 75DF at 2 ounces/acre + crop oil concentrate at 1% v/v
 - Gramoxone at 2 pints/acre + Lorox 50WG at 4 ounces/acre + crop oil concentrate at 1% v/v
 - Gramoxone at 2 pints/acre + atrazine 4L at 1 quart/acre + crop oil concentrate at 1% v/v
- There was a slight advantage to the Gramoxone + Sencor combinations.

We also looked at Select Max at both application timings. Select Max worked best on the smaller corn plants. It was not commercially acceptable in controlling the larger plants. However, I believe the current label does not allow you to replant corn for 30 days after application.

Planting Your Own Barley or Wheat for Cover Crops? Storage Tips for Ensuring Acceptable Seed Quality

Dr. Robert Kratochvil, Extension Specialist, Agronomic Crop Production

Many Maryland grain farmers use their stored wheat or barley as the seed source for planting cover crops. If you are one of those farmers you want to make sure that the grain you use will have the minimum 80% germination necessary to qualify for cover crop planting. In years when Fusarium (scab) is the cause of low germination, there may be little you can do to protect yourself from low germination. In this situation, you may have a field or part of a field that had less scab infection. This would be the best location to harvest and save the seed for your intended cover crop plantings. In addition, while harvesting this area, you should turn up the air on the combine to blow as many of the light kernels out the back of the combine.

Scab is not always the reason why you may have a low germination. Poor storage management can also cause spoilage problems that will impact your germination. The primary causes for grain spoilage is moisture and temperature. To avoid this, the best management practice is to harvest the grain when it is at acceptable moisture content for storage. Wheat or barley can be safely stored about 6 months at 12-13% moisture content. If the moisture content is greater than this, you should either dry the grain to a safe level or aerate the bin for a number of days with the fans. And, even if

your grain is at the acceptable level, don't assume it will be all right in our humid climate. Monitor the stored grain to make sure it does not heat and spoil.

Preparing your bins prior to storing the grain is another important management practice. Remove any spilled grain outside the bin and mow around the bin to reduce the chances of insect or rodent infestation resulting in damaged grain. Inspect bins and foundations for structural problems. Problems of this type can result in grain spills and provide entry points for water, insects, and rodents. Check fans and ducts for corrosion and damage. Remove any accumulated dust and dirt that will reduce the operating efficiency. You want them to work properly when you need them.

Ensure that the bins are clean before you add the new crop. Remove any old grain with brooms and vacuum cleaners. **Never put new grain on top of old.** Also, clean bins not being used for storage this year to keep insects from migrating to other bins.

If long term storage (over 10 months) is anticipated, consider treating the cleaned bin with an approved protective insecticide at least two weeks before adding any grain. Apply the spray to the point of run-



off to as many interior surfaces as possible, especially joints, seams, cracks, ledges, and corners. Also spray outside the bin at the foundation and near doors, vents, ducts, and fans.

The addition of a grain "protectant" is another practice that can ensure your grain will remain in good condition. A grain "protectant" is an insecticide that can be applied to the bulk grain as it goes into a storage bin. The treatment offers protection for about one season and should be considered if the grain may be held for more than 6 months.



Crop Reports

Western

Corn planting and first cutting hay are finishing up. Welcome rain is aiding all crops. Barley is in full head and is turning; harvest will probably be two weeks early. Wheat is also fully headed but has not begun to turn. Insect and slug pressure is greater than normal and believed to be because of our mild winter and unusually warm March.

Central

The last two weeks have been great for field work with full-season corn planting nearing completion and soybean planting in full swing. Corn emergence is excellent with the earliest plantings over a foot tall already. PSNT testing should begin now on the early corn. Soybean emergence is excellent, as well. All barley is turning and early maturing wheat has begun to turn as well. Very little scab has been seen and, although cold weather injury was expected, it has not been a problem on small grains. Growth of pastures has been excellent, but care needs to be taken on some farms to avoid overgrazing. Second cutting of alfalfa began the third week of May and grass hay harvest is progressing rapidly for both dry hay and baleage. Soil moisture has improved as widespread rain events occurred the last two weeks. The search for Brown Marmorated Stink Bugs (BSMB) and fruit flies continues.

Northeast

Conditions dry throughout most of the region. There have been some brief scattered showers but many areas have not had rain for 2 to 3 weeks. Corn is showing signs of stress from the hot and dry conditions. Most soybeans are planted

with some reports of insect feeding damage. Barley harvest is underway and wheat harvest will be earlier than normal.

Southern

Soil conditions vary across the region, but for the most part conditions remain good. Areas to the north have received more rain. Corn stands are in good to excellent shape. Problems associated with wetter soils at planting are showing up with some yellowing and uneven stands in isolated fields. Slugs have caused significant damage in some isolated fields. PSNT testing began last week and is continuing full swing this week. Results from farm to farm are more variable than past years, most likely due to variability in rainfall. Soybean planting continues, with germination occurring quickly and stands looking very good. Glyphosate resistant marestail pressure is very heavy this year. Many farmers are resorting to multiple sprays for control. Barley harvest will most likely start by Memorial Day weekend. Wheat is drying down very fast with harvest expected to be right behind barley harvest. There is some head scab in wheat, but so far it appears not to be a significant problem. There is also a fairly high level of Italian Ryegrass showing up in wheat this year.

Upper Eastern Shore

Moisture throughout the region is adequate for young corn plants and soybean germination. However, subsoil moisture is minimal and additional rain will be welcome. Barley is mature and harvest will begin before Memorial Day, weather permitting. Wheat has a few armyworms. A few fields of corn have been replanted due to birds, slugs, or grubs. With all the down corn last year, there are a few corn after corn fields with

substantial volunteer corn. Most are Roundup resistant hybrids after RR corn, so the only option is either cultivate or hoe! So, a few cultivators have been dug out of the edge of the woods. Sidedressing is well under way. Remember to do a PSNT to truth your nutrient management plan. Early planted beans are off to a good start. First cutting of hay is wrapping up.

Lower Eastern Shore

Now that the weather is cooperating, everyone is cutting hay with good yields reported. Corn planting is wrapping up and most corn has emerged and is rated good. Barley has turned with wheat soon to follow. Grain crops are rated good to excellent. Soil moisture is adequate at this time. Disease and insect pressure is light.

Timeline: This crop report is for the field observations from May 9 through May 22, 2012. Crop Report Regions: Western (Garrett, Allegany and Washington), Central (Carroll, Frederick, Howard, Montgomery), Northeast (Cecil, Harford, Baltimore), Southern (Anne Arundel, Prince George's, Calvert, Charles, St. Mary's), Upper Eastern Shore (Kent, Queen Anne's, Talbot, Caroline), Lower Eastern Shore (Dorchester, Wicomico, Worcester, Somerset).

Agriculture Weather Report

Adam Caskey, Meteorologist



The weather pattern over Maryland provided more spells of rain over the past few weeks, with more still needed in parts of the state, especially on the Eastern Shore. As matters of fact, according to the U.S. Drought Monitor, Garrett, Allegany, and Washington Counties aren't even considered abnormally dry any longer and Salisbury is a tenth of an inch above average for May rain thus far.

Improvements have been made, and it looks as though the weather pattern will offer near or above average rainfall through early June. However, irrigation may be needed in between showers as temperatures should rise along with the increasingly strong sun angle, which will more efficiently dry the soil. A large ridge is expected to develop and be a dominant weather feature in the atmosphere over the

Eastern U.S. for the last week of May and first week of June. This should translate to warmer than normal temperatures for Maryland. Also, this pattern favors a moist flow out of the Gulf of Mexico, which increases rainfall potential when a front or some other weather feature moves into Maryland. And, it's time to keep an eye on the tropics as we now enter hurricane season.

Announcements

2012 Pesticide Container Recycling Program from MDA



Maryland Department of Agriculture's **Pesticide Container Recycling Program** will be accepting clean, empty containers from June 1 through September 30, during normal business hours. Containers will be collected from their current owners, for safe disposal and recycling.

Containers must be cleaned (triple-rinsed or pressure-rinsed) according to label directions. Please remember to remove lids and label booklets from the containers prior to drop-off. Call 410-329-6010 or 410-692-2200 for hours of operation and drop-off instructions.

Collection dates and venues can be found at this link, <http://www.mda.state.md.us/pdf/recycle.pdf>

Maryland 4-H, Grains for Youth



Donate Grain! Make a Difference!

By donating grain, farmers provide opportunities for youth across Maryland and can save on self-employment tax, federal income tax, and state income tax.

How Do I Donate Grain?

1. Deliver the grain to one of the participating grain elevators.
2. Indicate how many bushels are for the Maryland 4-H program, making the Maryland 4-H Foundation the owner of those bushels.
3. Sign donation form, approving the grain donation and amount donated.
4. Grain will be sold at the current day's price and credited towards Maryland 4-H Foundation account.
5. The donating farmer will receive a tax deductible donation receipt from Maryland 4-H Foundation once payment has been received from the grain elevator.

For complete details:
www.mymaryland4hfoundation.com or call 301-314-7835

Participating Grain Elevators
Hostetter Grain, Inc.
(www.hostettergrain.com) & Nagel Farm Service (www.nagelgrain.com)

Hostetter Grain
Mt. Pleasant
9819 Kelly Rd
Walkersville, MD 21793

Hostetter Grain
Oxford, PA
481 Limestone Rd. Oxford, PA 19363

Nagel Farm Service
Wye Mills
14209 Old Wye Mills Rd
Wye Mills, MD 21679

Nagel Farm Service
Cordova
11761 Cordova Rd
Cordova, MD 21625

Nagel Farm Service
Harmony
6202 Nagel Rd
Preston, MD 21655

Nagel Farm Service
Preston
3695 Maple Ave
Preston, MD 21655

Upcoming Events

2012 AGsploration Summer Programs

2012 Dates and locations include:

- Tuesday, June 19th- Baltimore County Extension Office, Cockeysville, MD
- Thursday, June 21st- Queen Anne's County 4-H Park, Centreville, MD
- Tuesday, June 26th- Washington County Extension Office, Boonsboro, MD
- Tuesday, July 24th- Thendara 4-H Camp Center, Hurlock, MD (Dorchester County)
- Thursday, July 26th- Montgomery County Extension Office, Derwood, MD
- Thursday, August 2nd- Maryland 4-H Center, College Park, MD (Prince

George's County)

Registration cost is only \$15 for each participant and is limited to the first 50 youth at each site. The AGsploration program includes lunch, snacks, transportation to field trips, t-shirt and educational programming.

For additional information, please contact: April Hall Barczewski by phone at 410-996-5280 or 410-996-8134 or by e-mail at adhall@umd.edu

Food for Profit workshop on June 6th



Food for Profit is a one-day workshop designed to help you work through the maze of local and state regulations, food safety issues, and business management concepts that all must be considered in setting up a commercial food business.

Time: 9:00 AM - 4:00 PM

Location: Washington County Agricultural Education Center, 7303 Sharpsburg Pk (door #4), Boonsboro, MD 21713

Cost: \$ 40

For more details contact Ginger Myers at 301-432-2767 x338 or gsmyers@umd.edu

Procrastinator's Pest Management Conference to be held on June 8th

17th Annual Procrastinator's Pest Management Conference to be held at the UME Montgomery County office. Anyone needing pesticide re-certification in the following categories is welcome to attend: MD-2, 3A, 3C, 5, 6, 10.

Time: 8:00 am

Location: 18410 Muncaster Rd, Derwood, MD 20855

Contact: Chuck Schuster at cfs@umd.edu or 301-590-2807

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If you would like a hard copy please contact your local county extension office to sign-up for the mailing list. The list of local county offices can be found at www.extension.umd.edu.



Did You Know

Only about 1 percent of the corn we grow is eaten as corn.

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Sudeep Mathew, Editor

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