

# WEEKLY CROP UPDATE



UNIVERSITY OF DELAWARE  
COOPERATIVE  
EXTENSION

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## Last Weekly Issue of WCU for 2022

This is the last weekly issue of Weekly Crop Update for the 2022 season. I hope that this newsletter has been a useful resource to you as you dealt with the challenges of this past growing season.

There will be a monthly update to the WCU Blog with notes, articles and announcements from October through February. Notification of the monthly updates will be sent to email subscribers.

My thanks to the Extension specialists and agents who have contributed articles this year – the WCU would certainly not be possible without them. If there were WCU articles that you found particularly useful this year I hope you will let the writer know. My thanks as well to Karen Adams, who gets WCU to mail subscribers and Katie Young who helped with posting the blog this year.

Best wishes for a safe and prosperous fall harvest season!

Kind regards,  
Emmalea Ernest, editor of WCU  
*Scientist - Vegetable Crops*; [emmalea@udel.edu](mailto:emmalea@udel.edu)



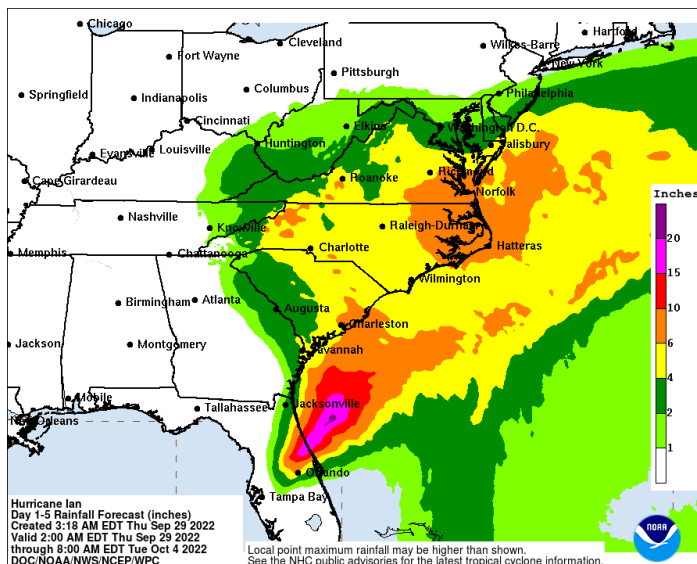
## Vegetable Crops

**Time for Greenhouse Weed Control** - David Owens, *Extension Entomologist*,  
[owensd@udel.edu](mailto:owensd@udel.edu)

Now is the time to wipe out all weeds growing in and immediately around greenhouses. Weeds in the greenhouse and winter annuals such as chickweed, henbit, dead nettle, and speedwell serve as spider mite hosts and provide shelter for spider mites to overwinter. Going into winter with a clean greenhouse and foundation edge will reduce the possibility of having early season mite activity on transplants. A couple of ounces of caution in the form of herbicide can prevent pounds of active ingredient 'cure' in the form of miticides to fields that have been planted with infested transplants.

**Flooding, Waterlogged Soils and Effects on Vegetables with Special Consideration for Plasticulture Vegetables** - Gordon Johnson, *Extension Vegetable & Fruit Specialist*;  
[gjohn@udel.edu](mailto:gjohn@udel.edu)

Hurricane Ian is expected to bring heavy rains to Delmarva and flooding can be expected. With late summer crops such as lima beans still in the fields, fall crops such as broccoli and cabbage nearing harvest, and strawberries just planted on plastic, damage from excess water is a concern.



Predicted rainfall from Hurricane Ian.

In addition, climate scientists predict that extreme weather events will become more common on Delmarva over the next several decades. This will present additional challenges for vegetable growers related to flooding, wet weather diseases, nutrient losses, ability to do timely harvests, field compaction, other wet soil issues, and resulting crop losses.

In flooded soils, the oxygen concentration drops to near zero within 24 hours because water replaces most of the air in the soil pore space. Oxygen diffuses much more slowly in water filled pores than in open pores. Roots need oxygen to respire and have normal cell activity. When any remaining oxygen is used up by the roots in flooded or waterlogged soils, they will cease to function normally. Therefore, mineral nutrient uptake and water uptake are reduced or stopped in flooded conditions (plants will often wilt in flooded conditions because roots have shut down). There is also a buildup of ethylene in flooded soils, the plant hormone that in excess amounts can cause leaf drop and premature senescence.

In general, if flooding or waterlogging lasts for less than 48 hours, most vegetable crops can recover. Longer periods will lead to high amounts of root death and lower chances of recovery.

While there has been limited research on flooding effects on vegetables, the following are

some physiological effects that have been documented:

- Oxygen starvation to vegetable roots will cause roots to cease to function resulting in plant collapse with limited recovery potential
- Oxygen starvation in root crops such as potatoes will lead to cell death in tubers and storage roots. This will appear as dark or discolored areas in the tubers or roots. In carrots and other crops where the tap root is harvested, the tap root will often die leading to the formation of unmarketable fibrous roots.
- Ethylene buildup in saturated soil conditions can cause leaf drop, flower drop, fruit drop, or early plant decline in many vegetable crops.
- Leaching and denitrification losses of nitrogen and limited nitrogen uptake in flooded soils will lead to nitrogen deficiencies across most vegetable crops.
- In bean crops, flooding or waterlogging has shown to decrease flower production and increase flower and young fruit abscission or abortion.
- Lack of root function and movement of water and calcium in the plant can lead to calcium related disorders in plants. There is a potential for higher incidence of blossom end rot in tomatoes, peppers, watermelons, and other susceptible crops when fruits are forming and soils are saturated.

Low lying areas of fields are most affected by excess rainfall. However, cropping practices can also increase water standing. In vegetables, field compaction will reduce water infiltration leading to increased crop losses in wet weather.

### Plasticulture Concerns in Wet Weather

In plasticulture, water can accumulate and persist between rows of plastic mulch because of the impervious surface of the mulch. Because much of the rainfall runs off the plastic, water pooling can be serious problem in plastic mulched fields, especially where row middles have become compacted. Vining crops that fruit into the row middles can have vines and fruits sitting in water and this produces ideal conditions for diseases of wet conditions to develop. A prime example is *Phytophthora*

*capsici* (a water mold) that needs saturated soils or standing water to infect plants (fruits). *Phytophthora capsici* grows at 10 to 36°C (50 to 97°F), with optimal temperatures of 24 to 33°C (75-91°F).

When water overflows the bed tops of plastic mulched crops, whole beds become saturated as water enters the planting holes. This often leads to plant losses as beds take a very long time to dry once saturated in this way and oxygen is very limited in the root zone.

To avoid water accumulation between plastic mulched beds, tilling with a deep shank or a subsoiler in row middles can help improve drainage. Cut drainage channels at row ends to reduce blockage (dams) that can back up water. Where practical, section plasticulture fields and install cross drains to remove extra water to improve drainage and reduce water damage potential. Growers may also choose not to plant lower areas in the field prone to water damage where plastic is laid.

In some crops, such as peppers and strawberries, high raised beds will improve drainage significantly and can reduce losses to water standing between plastic rows. Another option in watermelons (and other strongly vining crops) grown on plastic is to reduce plastic bed width and increase distance between rows to limit impervious surfaces.



Compaction between mulched beds can lead to increased ponding.

In some crops in our region (plasticulture strawberries for example), cover crops such as ryegrass are being grown between beds to

reduce erosion. Research on row middle management will be a priority for the future.



When water goes over top of beds they become saturated for long periods leading to plant losses. In this case the water just missed going over the bed (note the trash line).

#### Identifying Poorly Drained Areas for *Phytophthora capsici* Management

Growers with crops susceptible to *Phytophthora capsici* (P. cap) are encouraged to evaluate fields with susceptible crops (all vine crops, tomatoes, peppers, lima beans) for drainage issues where this disease can proliferate. The primary keys to P. cap management are limiting standing water, the potential for saturated soils, and water movement across the crop.



Row middles with ponding due to a field depression.

### Recovering from Flooding or Waterlogging

One option to aid in vegetable crop recovery after floods or waterlogging is to aerate the soil by cultivating (in crops that can be cultivated) as soon as you can get back into the field. This allows for oxygen to enter the soil more rapidly. To address nitrogen leaching and denitrification losses, sidedress with 40-50 lbs of N where possible depending on the crop and crop stage.

In vegetable fields that remain wet, consider foliar applications of nutrients. Since nitrogen is the key nutrient to supply, spraying with urea ammonium nitrate (28 % N solution) alone can be helpful. These can be sprayed by aerial or ground application. Use 5 to 20 gallons of water per acre. The higher gallons per acre generally provide better coverage. As with all foliar applications, keep total salt concentrations to less than 3% solutions to avoid foliage burn.

### Future Considerations

To address excess water challenges in the future, vegetable growers will need to invest in and plan for drainage in every field. Solutions including land levelling, surface drainage, tiles (tile wells, patterned tiling), and pumping may all need to be considered. [See this article by James Adkins on drainage basics.](#)

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**Winter Squash for Extended Sales** - Gordon Johnson, Extension Vegetable & Fruit Specialist; [gcjohn@udel.edu](mailto:gcjohn@udel.edu)

Growers with CSAs, sales to schools and institutions, or restaurant customers should consider storing and marketing winter squash. Winter squash include a wide range of types including butternuts and neck pumpkins, acorns, spaghetti squash, buttercup and kabocha types, delicata and dumpling types, hubbards, cheese pumpkins, and others. Many of these have the ability to be stored for long periods, especially butternuts, buttercups, and spaghetti types. New England has a tradition of eating large quantities winter squash; however, the further south you get, the less they are eaten. This may require customer education in order to market successfully. For example, butternut squash is great in soups, pastries, and casseroles and spaghetti squash is a fine low calorie, low carb, pasta substitute.

Having winter squash for winter sales requires proper handling and storage. Follow a regular fungicide program during crop production to produce disease free fruit to minimize postharvest fruit rots. Harvest when fruits are mature and prior to frost. Use care in handling fruit to prevent wounds. Wounding can negate benefits from a season-long fungicide program. Cure fruit after harvest at temperatures between 80 and 85°F (27-29°C) with a relative humidity of 75-80% for approximately 10 days. Temperatures below 50°F (10°C) cause chilling injury. The hard-shelled squashes, such as Butternut, Delicious, Spaghetti, and the Hubbard strains, can be stored at 55°F (13°C) and 50-70% relative humidity. Acorn squash will store for 5-8 weeks; pumpkins for 2-3 months and other hard-shelled squashes will store for 3-6 months.



Research has not documented any benefit to post-harvest fruit fungicide dips.

For storage, a ventilated storage shed with supplemental heat works well. Basements are ideal. Empty greenhouses can be used if fans are run to keep the heat down in the day and heat is run to keep the temperature above 50° F (a significant cost). A cold room/box kept at 55° F will also work. Under these conditions, the longer keeping winter squash types can be kept in saleable condition through late winter, into spring.



Hubbard squash stores well.



T Elkner, Penn State

Butternut squash stores well for 6+ months.



Cheese types are similar to butternut squash in keeping ability



T Elkner, Penn State

Acorn squash has a shorter storage period of about 3 months



Japanese types are long keepers.



Wheel types will keep for 4 months

## Fruit Crops

### **New Project on Indoor Production of Strawberries in a Converted Poultry House**

- Gordon Johnson, Extension Vegetable & Fruit Specialist; [gcjohn@udel.edu](mailto:gcjohn@udel.edu)

When poultry growers lose a contract to grow chickens for an integrator, these poultry houses are retired or are left unused, and income is lost. There are over 1200 such houses on the Delmarva peninsula. There is interest in converting these houses into indoor lighted hydroponic growing facilities as a new income source. The long-term vision is to create opportunities for farmers with retired poultry

houses to profit by growing produce for regional markets. To do so, the University of Delaware Cooperative Extension Fruit and Vegetable program and the Delaware Indoor Agriculture Laboratory (DIAL) in Plant and Soil Sciences are teaming up with a local farmer to provide research, outreach, and training for prospective growers.

A demonstration unit for lighted indoor hydroponic production of strawberries will be created in a retrofitted poultry house. Protected culture of strawberries is a growing field with most production occurring in the field under low tunnels or in high tunnels. More recently, attention has been paid to greenhouse production of strawberries in off seasons with greenhouse growers marketing strawberries as locally grown.

Interest has been growing for lighted indoor production of strawberries using existing facilities such as warehouses. This project will assess the potential of using empty poultry houses for that production. Currently, research on indoor lighted strawberry production is very limited. In this project, University of Delaware researchers will conduct optimization research on these strawberries including cultivar evaluations, plant density studies, and lighting program evaluations. Information from these efforts will be extended through electronic resources, field days, grower informational meetings, and on-farm training sessions.

An additional goal is to demonstrate how to convert a poultry house to address food safety concerns for produce production.

Delmarva is adjacent to large markets and year-round production of strawberries in these retrofitted poultry houses could provide premium product to these regional markets rather than shipping from California, Mexico, or Florida.



# Agronomic Crops

**Agronomic Crop Insect Scouting** - David Owens, Extension Entomologist, [owensd@udel.edu](mailto:owensd@udel.edu)

## Small Grains

The hessian fly free date for New Castle County is October 3, Kent October 8, and Sussex October 10. If planting early, look for varieties resistant to hessian fly. Historically this has been around the first bout of cold weather. I suspect that these dates may need to be updated, but hessian fly populations have been very low for a number of years.

Another pest that can sometimes cause issues in small grains is the aphid complex. You can see a great UD Extension video on scouting for aphids here featuring Bill Cissel:

[https://www.youtube.com/watch?v=He3nTpL6k\\_U](https://www.youtube.com/watch?v=He3nTpL6k_U). The English grain and bird cherry oat aphids are the most common aphid species. Examine a linear row-ft in 5-10 locations in the field. One way to easily find aphids is to look through a backlit leaf, with the leaf between you and the sun. Backlit aphids will show up very easily.

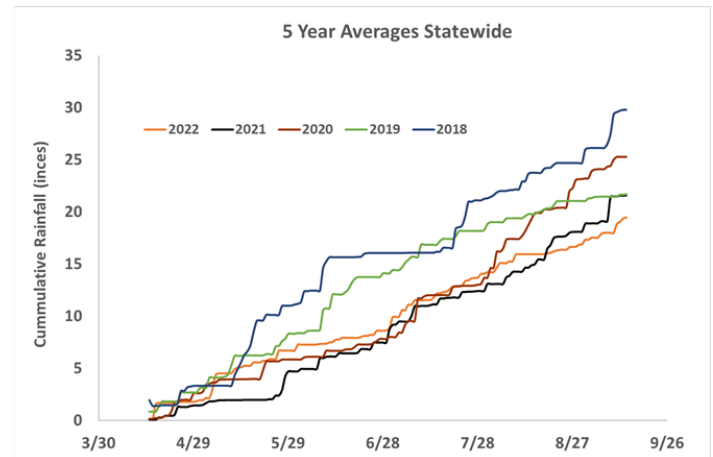
In the last several years, barley yellow dwarf virus has not been very prevalent, but there are areas of the state with more of it. If your fields have a history of barley yellow dwarf virus, consider planting those fields towards the latter part of the planting window. Insecticide seed treatments can be an option, but they do not generally result in yield increases and only provide protection for 2-3 weeks after germination. Southern states use a fall threshold of 20 aphids per row foot in fields that have a history of barley yellow dwarf virus and cold weather is not in the forecast. Some northern states use a threshold of 100 aphids per row ft.

## Alfalfa

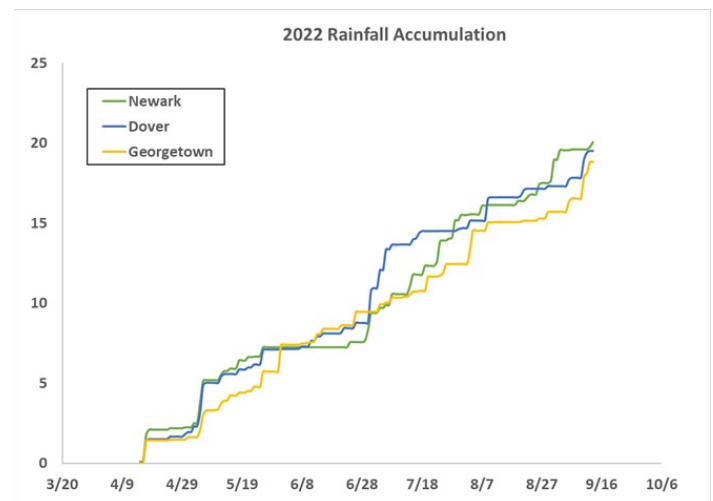
So far, we do not seem to be on a very unusually warm weather pattern. Last year, there were reports of alfalfa weevil damage in Kentucky in December. If we have mild warm, non-freezing weather into December and January (last year was 70 degrees before it snowed a foot) it may be worth a quick look at the terminals.

**2022 Weather and Corn Growth** - Jarrod O. Miller, Extension Agronomist, [jarrod@udel.edu](mailto:jarrod@udel.edu)

The last two years (2021 and 2022) have been relatively dry over the growing season, with 2018 being the wettest recent year (Figure 1). Across the state we accumulated similar amounts of rainfall (Figure 2), but very dry periods in Georgetown were evident across August, when most grain fill is taking place.



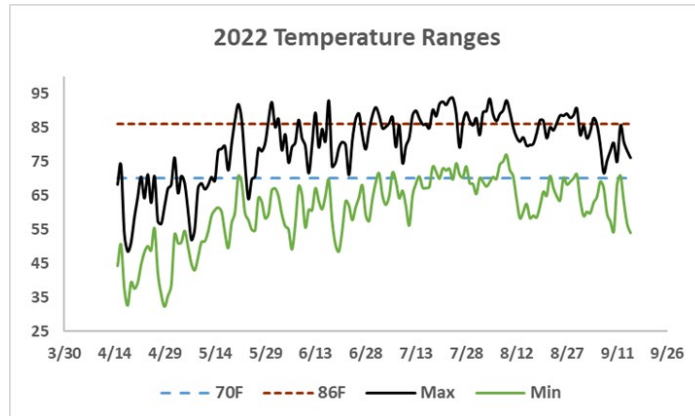
**Figure 1.** Average Delaware cumulative rainfall over the last five years.



**Figure 2.** Average cumulative rainfall at three 2022 locations.

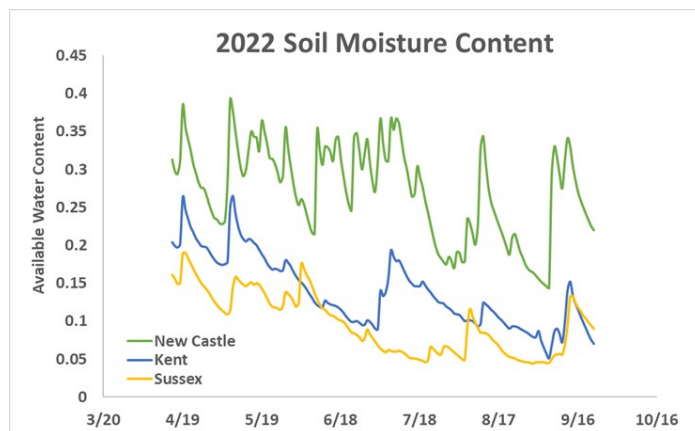
Grain fill is not the only likely time when stress may have occurred, as pollination may have also occurred during times of high temperatures and low soil moisture. Corn becomes stressed when daytime temperatures are above 86°F, which occurred several times between May and September (Figure 3). It should be noted that Figure 3 represents maximum and minimum

temperatures, and that day-time temperatures did not necessarily sustain temperatures above 90°F all day long.



**Figure 3.** Average min and max statewide temperatures in 2022.

If you planted corn in Newark on April 15<sup>th</sup>, pollination would have occurred around July 11<sup>th</sup> versus planting on May 15<sup>th</sup>, when pollination would have occurred around July 16<sup>th</sup>. Due to cooler weather in April, growing degree days accumulate slower leading to a week's difference in growth stages, even when they were planted a month apart. There was a smaller window of cooler weather around July 11<sup>th</sup>, and soil moisture was still adequate (Figure 4) in northern Delaware. However corn pollinating at the end of the week may have seen higher temperatures.



**Figure 4.** Soil water content at three DEOS stations in 2022.

In the southern end of the state, planting April 15<sup>th</sup> should have led to pollination around July 5<sup>th</sup>, while planting mid-May pushed back pollination to July 11<sup>th</sup>. While this was also a

warm period, it was not as hot as late July when June planted corn may have been pollinating.

The problem for southern Delaware was the spotty rainfall and lack of soil moisture, which is evident in Figure 4. As measured by our DEOS station in Georgetown, volumetric water content was very low the entire summer, so that any fields without irrigation should have been extremely stressed (due to finer texture, Newark soils will show higher water content than Kent and Sussex counties). Additionally, during July, nighttime temperatures were often above 70°F, increasing corn respiration and using up any energy stored from the sun. While the cooler nights in early April would have helped with grain fill, it is likely drought conditions and heat had already limited any yield potential. These graphs cannot cover all the conditions observed across the state but can give you a general idea of where stress may have reduced yields compared to the past few years.

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**Monthly Grain Market Outlook** - Nate Bruce,  
Farm Business Management Specialist,  
[nsbruce@udel.edu](mailto:nsbruce@udel.edu)

**Written 9-30-2022**

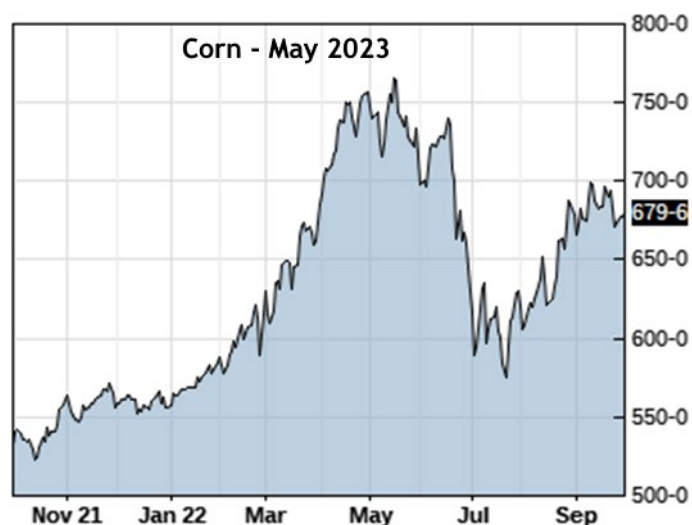
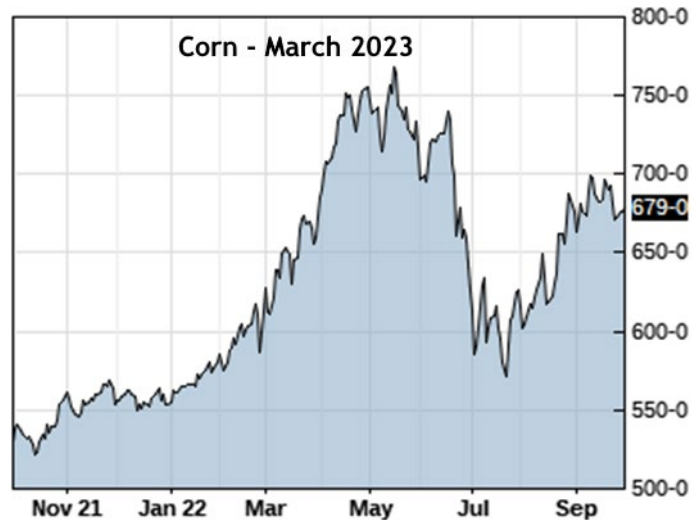
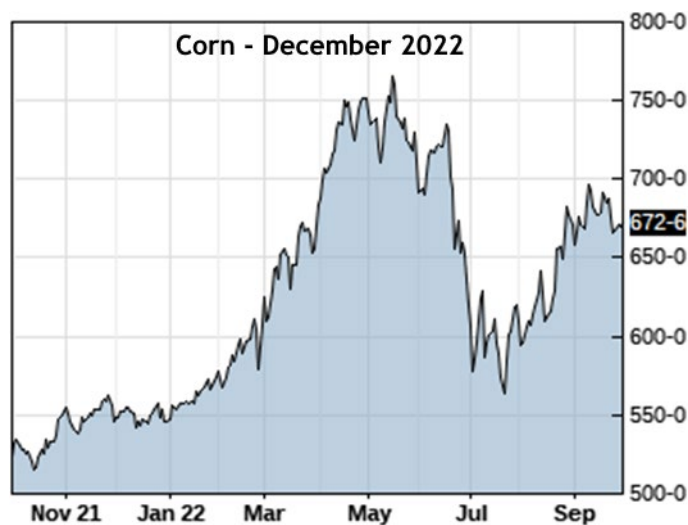
Corn prices steadily rose over the month of September, nearing the \$7.00 / bushel mark. Prices have retreated since in the last two weeks. With harvest fully underway, have the market high prices passed already? Soybean prices have shown support at the \$14.00 / bushel level in September but failing to break the \$15.00 / bushel mark. Until harvest gets underway, there will be very little movement in soybean prices. September is a month where soybeans have historically hit highs and it is possible, we've seen this occur over the course of the past month. Wheat prices rallied over the course of September and have taken a saucer bottom appearance in the market. This has been caused by renewed tensions in Ukraine this month with Putin calling a general military mobilization and threatening the use of nuclear weapons. It is clear this conflict is far from over and it is impacting wheat prices.

The September USDA World Agriculture Supply and Demand Estimates Report (WASDE)



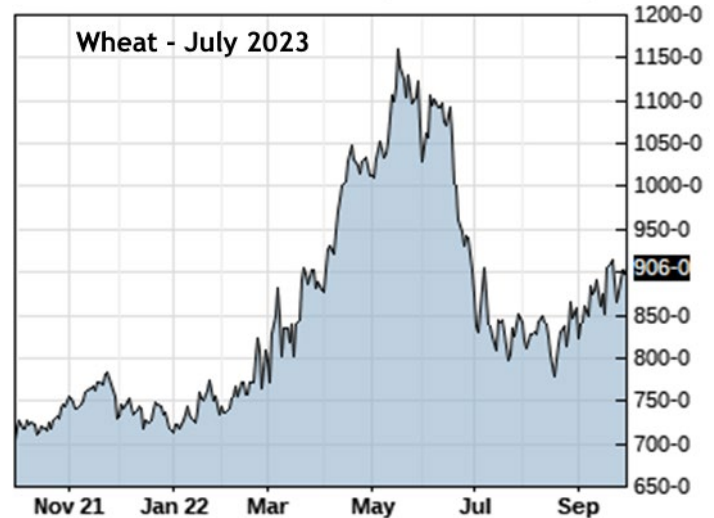
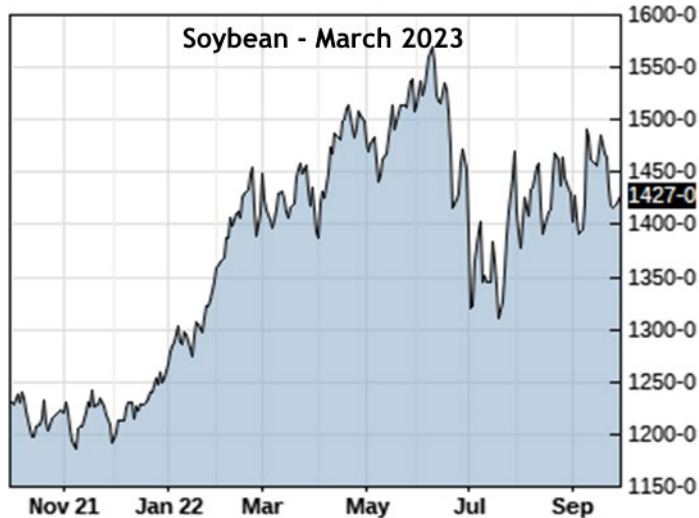
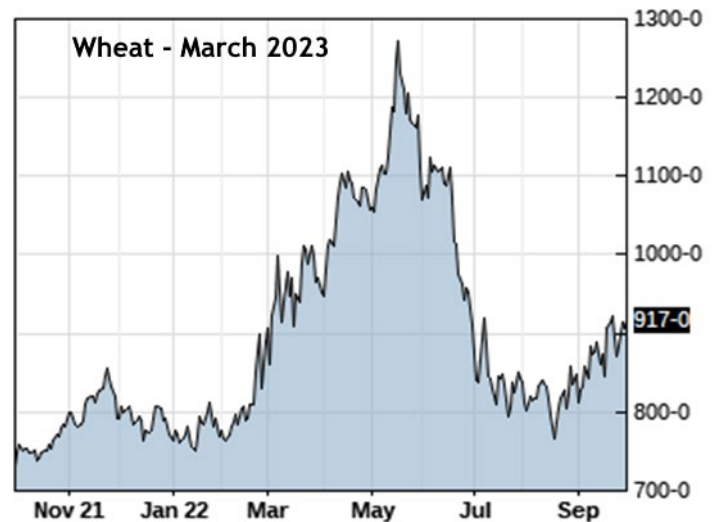
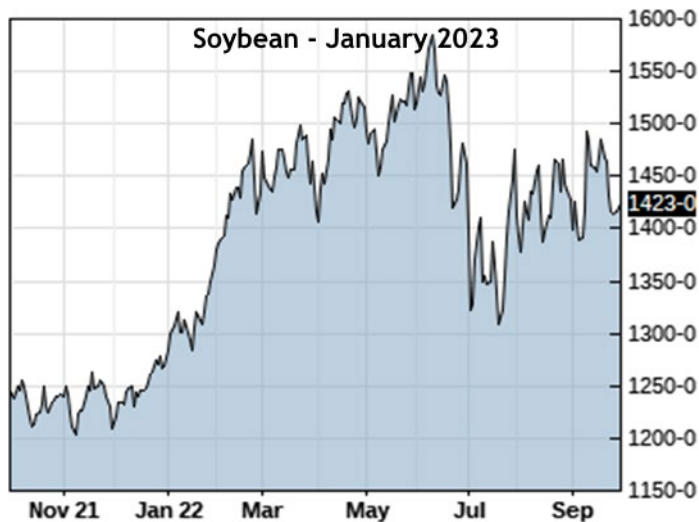
estimated corn ending stocks at 1.219 billion bushels, down 12% from the August estimate of just under 1.39 billion bushels. The USDA WASDE estimated reduced demand for corn for ethanol use, feed use, and exports from the August estimate. Soybean ending stocks were projected at 200 million bushels, down 19% from the August estimate of 245 million bushels. The USDA WASDE estimated reduced demand for soybean crushing, exports, production, and residual from the August estimate. Wheat ending stocks were projected at 610 million bushels, unchanged from the August estimate. The USDA WASDE estimated the demand for wheat unchanged from the August report. As of this week, 218 cargo ships have carried grain out of Ukraine. This will be something to watch in the coming weeks especially as the war changes pace with Ukrainian advances taking back land held by Russian forces since the war's onset. Expect 2022 market volatility to continue into 2023 as uncertainty about carryover is still prevalent. Below are several futures for corn, soybeans, and wheat.

#### Corn Futures

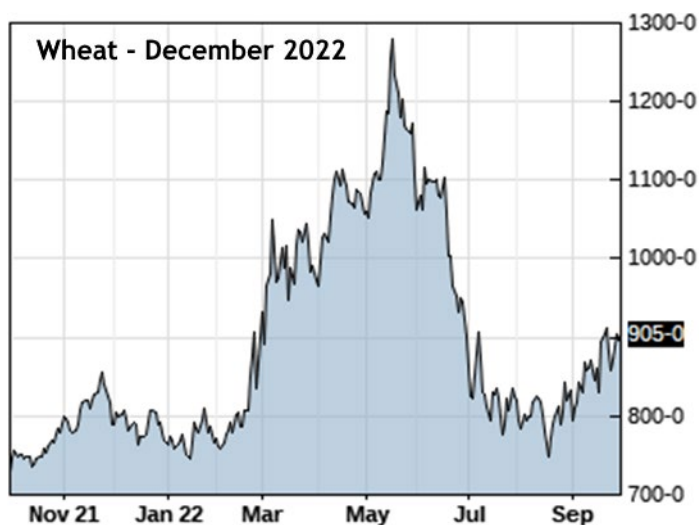


#### Soybean Futures





### Wheat Futures



## General

### Nuffield International Scholarship - USA for a Farmer or Agricultural Professional

#### *\$25,000 Scholarship Travel Bursary for Agricultural Study Abroad*

Nuffield International Farming Scholars - USA announces the application period for a \$25,000 Scholarship to support international travel and study in 2023 related to global agriculture is open from July 15 to October 21. **One scholarship is supported by Mid-Atlantic Farm Credit, Delaware Dept. of Agriculture, Mountaire Farms and the Mid-Atlantic Farm Credit Foundation and is dedicated to a farmer or agricultural professional residing and working in Delaware, Maryland, Pennsylvania,**

and certain counties of Virginia and West Virginia. Nuffield USA is aligned with Nuffield International, which is a 13-member country organization founded in the UK in 1947. Typically, 60 to 70 scholars participate each year. U.S. applicants must be between 25- and 45-years old and U.S. citizens.

Nuffield International Farming Scholars is a unique global network of farmers, ranchers, and agri-professionals that focuses on: personal capacity building; excellence in agricultural production, distribution and management' and local, national and global thought leadership. Over 1,700 Nuffield alumni hail from the 13 Nuffield countries.

The Scholarship supports travel and participation in its annual week-long meeting, the Contemporary Scholars Conference (CSC), held in March. In 2023, the CSC will be held in British Columbia, Canada. The next component is the Global Focus Program, a four-week program in which scholars travel in small groups to 4 or 5 countries. Each group consists of scholars from different countries. The final component is the Independent Research Topic, a self-directed 5-week travel program to explore a selected research topic. A 10,000-word report is required at the completion of the program, which is posted on the Nuffield International website.

Three scholarships, sponsored by TIAA, Bayer Crop Sciences, and the Canadian PSP are open to applicants from the United States, Chile and Brazil. Four state-based scholarships are open to residents of California, Iowa, North Carolina and the Mid-Atlantic states of Delaware, Maryland, Pennsylvania and certain counties of Virginia and West Virginia: Morgan, Berkeley, Jefferson, Frederick, Clarke, Warren, Shenandoah, Page, Hancock, Brooke, Ohio and Marshall.

*Additional information and the application form is available on the Nuffield International website, [Nuffieldinternational.org](http://Nuffieldinternational.org). For specific information regarding the U.S. program, please email Ed Kee, President of Nuffield USA at [kee@udel.edu](mailto:kee@udel.edu). Or, for Delaware perspective, please email our Delaware-based scholars, Georgie Cartanza (2017) at*

*cartanzachick@comcast.net or Susan Truehart Garey (2019) at [truehart@udel.edu](mailto:truehart@udel.edu).*

## Announcements

### Mid-Atlantic Crop Management School

November 15 – 17, 2022

Princess Royale in Ocean City, MD

Registration is now open for the Mid-Atlantic Crop Management School, which will be held in-person at the Princess Royale in Ocean City, MD from November 15 – 17, 2022. The school offers a 2 ½ day format with a variety of breakout sessions. Emphasis is placed on new and advanced information with group discussion and interaction encouraged. Individuals needing training in soil and water, nutrient management, crop management, and pest management can create their own schedule by choosing from 5 program options offered each hour.

New this year for CCAs: we are offering specialty CCA certification credits in sustainability and precision agriculture. Specialty credits count toward recertification for the associated specialty certification or can be applied toward your overall CCA recertification credit requirements (for individuals not holding a specialty certification). We also anticipate offering state nutrient management credits for DE, MD, PA, VA, and WV and state pesticide credits for DE, MD, NJ, PA, VA, and WV.

Online registration will close at 11:59 p.m. EST on Monday, November 7, 2022. Registration Fees are \$325 by October 15, and \$375 from October 16 through November 7. We look forward to seeing you there.

Registration and program details are online at: <https://go.umd.edu/crop22registration>

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### Maryland Advanced Grazing Workshop with Ranching for Profit

October 20-21, 2022 9:00 a.m.-5:00 p.m.

University of Maryland - Western Maryland Research & Education Center 18330 Keedysville Road  
Keedysville, MD 21756

This advanced grazing workshop will dive deeper into the principles behind farm economics and increasing farm profitability.



This advanced grazing workshop is designed for producers looking to transform their operation into a profitable business with less work and stress. Workshop attendees will dive deeper into the principles behind farm economics and increasing farm profitability, giving you the tools and insights you need to improve your business.

Additional details and registration online at:  
<https://www.eventbrite.com/e/maryland-advanced-grazing-workshop-with-ranching-for-profit-tickets-396351346547>

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## Delaware Agriculture Week

Monday, January 9 – Thursday, January 12, 2023

Delaware Agriculture Week will be back at the Delaware State Fairgrounds in Harrington from January 9-12, 2023! Delaware “Ag Week” is an ongoing collaboration between University of Delaware Cooperative Extension, Delaware State University Cooperative Extension and the Delaware Department of Agriculture.

Delaware Ag Week provides useful and timely information to the agricultural community and industry through educational meetings and events. In addition, it is a great time for networking and fellowship with old and new acquaintances.

The associated trade show will take place in the Dover Building from Monday afternoon, January 9 to Thursday January 12.

Delaware and Maryland pesticide and nutrient management credits and CCA credits will be available.

We are busy planning sessions and agendas, but please keep an eye on the Ag Week website for information and updates. <https://sites.udel.edu/delawareagweek/>

### **Tentative Session Schedule**

#### **Monday, Jan. 9**

Poultry  
Beef  
Fruit  
Woodland

#### **Tuesday, Jan. 10**

General Vegetables  
Fresh Market Vegetables

Hay and Pasture  
Small Ruminant  
Farmers Market Managers  
Specialty Crop Block Grant

#### **Wednesday, Jan. 11**

Processing Vegetables  
Pollinators  
Nutrient Management  
Risk Management  
Small Flock Poultry  
Small Farm Irrigation

#### **Thursday, Jan. 12**

Agronomy/Soybean  
Urban Farm and Food

## Weather Summary

Updated weather maps are not available this week.

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### ***Weekly Crop Update is compiled and edited by Emmalea Ernest, Scientist - Vegetable Crops***

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