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AGMatters

September 2023 Produce, Tobacco & Dairy News

Cooperative Extension Service

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Factors Affecting Bell Pepper Fruit Size and Shape

Emmalea Ernest, Univeristy of Delaware Extension Fruit & Vegetable Specialist

ell pepper fruit must reach adequate size, have a symmetrical shape, and have an acceptable height to diameter ratio in order to be marketable, especially in wholesale markets.

Bell pepper fruit characteristics are influenced by variety, but also by environmental factors that occur during flower formation and early fruit development. Horticultural researchers have attempted to identify specific environmental factors that affect pepper size and shape, but some mysteries remain.

High and low nighttime temperatures are known to impact pepper fruit set, size, and shape. Both high and low nighttime temperatures result in poor pollination which can cause small and lopsided pepper fruit (Figure 1).

Night temperatures that are below 64 °F reduce pollination and increase the incidence of parthenocarpic (seedless) fruit. Parthenocarpic fruit tend to be smaller and are likely to be unmarketable. Low night temperatures also cause ovary enlargement during flower

development that results in short fruit that do not elongate properly (Figure 2). These short, flattened peppers are also likely to be unmarketable.

Longer pepper fruit develop from flowers that form during warm nighttime (68-75°F) conditions. Excessively high nighttime temperatures (90°F) applied to peppers in experimental situations cause fruit set to

cease because of damage to pollen; high temperatures do not induce parthenocarpic fruit. The nighttime high temperature threshold for damage to pepper pollen has not been established but is probably higher than the typical night temperatures experienced in Delaware.

Pepper fruit size is also influenced by photosynthate availability during fruit development. The photosynthate availability will depend on plant size, leaf area, and fruit load. Plants that do not reach adequate size before flower-



Figure 1

ing begins will not produce marketable size fruit.

Plants that set many peppers at the same time will also tend to produce small fruit because of competition between fruit. To avoid small fruit size, provide adequate nutrients and irrigation early in the season to promote leaf and stem growth in pepper plants. Use of shade cloth in peppers can help to promote early season vegetative growth. Later in the season, damaged, undersize, and small misshapen fruit should be re-

moved from the continued on pg. 8

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UpcomingEvents

October 9

Pennyrile Beekeepers, 6PM Christian County Ag Expo, 270-886-6328

October 14

Kentucky Christmas Tree Association Fall Meeting Harrodsburg, KY

November 9

Kentucky Fencing School KY Soybean Board Princeton, KY

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Endangered & Threatened Species Pesticide Labeling

Dr. Ric Bessin, Kentucky Pest News, 8.8.23

ver the next years and decades, the Environmental Protection Agency (EPA) will begin to add endangered and threatened species protections to pesticide labeling. This will occur as new products are approved or during the registration review process.

The goal of EPA's Endangered Species Protection Program (ESPP) is to carry out EPA's responsibilities under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) in compliance with the Endangered Species Act (ESA), without placing unnecessary burden on agriculture and other pesticide users. All pesticide products that EPA determines "may affect" a listed species or its designated critical habitat may be subject to the ESPP.

If the pesticide label directs you to use an Endangered Species Bulletin, then you are required to obtain a product-specific bulletin found in the Bulletins Live! Two system no earlier than 6 months prior to using the product. On this website, the applicator will need to indicate the area of application and EPA registration number(s) of the product(s) they will use in order to generate a bulletin. Applicators must follow any restrictions on these bulletins, as well as on the pesticide

ndangered Species

Bulletins Live! Two -- View the Bulletins





labelling for the application area, pesticide product, and application month. When referenced on a pesticide label, bulletins are enforceable use-limitations under the FIFRA.

Often, there may not be any geographically specific use limitations for the product you are applying even if your label directed you to this website because either:

- 1. EPA has not yet completed the process of identifying whether additional geographically specific use limitations are needed, or
- 2. There are no additional geographically specific use limitations required for the time period and location you plan to apply the pesticide product

EPA continues to complete Endangered Species Act consultations and update the 'Bulletins Live! Two' system with additional geographically specific use limitations that may be applicable to your pesticide product in the future.

Therefore, before you apply a pesticide, check to see if new or additional directions for the product have been added to 'Bulletins Live! Two.' It's important to note, you have a 6-month window to obtain a bulletin before you apply a pesticide (e.g., you can obtain a bulletin January 1 to July 1 if you plan to apply the pesticide on July 1). If the product will be used again the following year, a new bulletin must be obtained.

First Confirmation of Tar Spot on Kentucky Corn

Kiersten Wise, University of Kentucky, 9.12.23

ar spot on corn was confirmed by the University of Kentucky Plant Disease Diagnostic Laboratory (PDDL) from samples collected in Caldwell County on September 7. This is the first confirmation of tar spot in Kentucky in 2023.

So far, this is the only location in Kentucky in 2023 where tar spot has been confirmed. At this point in the season, no management is needed if tar spot is confirmed in a field; however, it is still important to document confirmed cases to monitor for future disease spread and impact. Tar spot was found in Todd and Ohio Counites in 2021, and Lincoln County in 2022.

Symptoms & Signs

Tar spot on corn, caused by Phyllachora maydis, is usually first observed when the causal fungus produces small black structures called stromata on leaf tissue (Figure 1). These structures protrude from the leaf surface and affected areas of the leaf feel rough or bumpy. The stromata can also be present on leaf sheaths and husks.



Figure 1. Signs of tar spot observed on a corn sample from Caldwell County in 2023 (Photo: Kiersten Wise, UK)

Tar Spot Distribution

Tar spot was first confirmed on corn in the United States in 2015. Since 2015, it has been reported in multiple midwestern and eastern states, Ontario in Canada, and as far south as Georgia and Florida. A map of the current tar spot distribution in the United States can be found on the corn ipmPIPE website.

Impact

Yield loss due to tar spot varies and depends on hybrid susceptibility, infection timing, and environmental conditions. Fungicide applications at tasseling/silking (VT-R1) for diseases such as southern rust will also effectively manage potential tar spot outbreaks. Plant pathologists continue to learn about this disease, and research in Kentucky's specific climate is needed to optimize management recommendations for the Commonwealth.

Yellow or Blue Sticky Cards

Dr. JC Chong, Clemson University

he typical recommendation is to use blue cards for thrips and yellow cards for everything else. There's quite a bit of data, from both indoor and outdoor crop systems, to support this recommendation. Thrips are also attracted to yellow sticky cards, albeit they're a little harder to see on a yellow background.

I heard from some folks that the reason they don't want to use yellow or blue sticky cards is because they

don't want to capture their biological control agents, particularly the parasitic wasps they release. The data I've seen isn't particularly conclusive on which color attracts more biological control agents. Many seem to suggest more by-catch of parasitic wasps on blue cards and predatory insects on yellow cards. One work around is to remove the sticky cards for a few days after release so that you don't capture the biological control agents by mistake.

Ultimately, I only care if y'all use sticky cards or not. If you don't want to

guess, then use yellow sticky cards. Sticky cards are so cheap and easy to use, and they give us so much information about the presence, identity and abundance of insect pests. Why don't we use them more often? There's really no excuse.



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Look Before Leaping into a New Vegetable Crop

Richard VanVranken, Growing Produce Magazine, 8.23.23

on't forget to make sure you have a market for a new crop before growing it. Despite some national attention, yacon (shown here) didn't have a market when a few growers introduced it in New Jersey.

When growers consider adding a new crop to their seasonal plans, one important question tends to get overlooked. Who actually buys and consumes that produce?

We chance upon a new produce item in a grocery store, or see/read a story about some new crop that's all the rage, and suddenly we're trying to see if our growers can add it to their crop mix, assuming it will be highly profitable, with such high prices on the market shelves and all that publicity.

Take for instance, yacon (Smallanthus sonchifolius) or Peruvian ground apple, a South American plant grown for its sweet-tasting tuber.

My colleague Peter Nitzsche, Morris County (NJ) Agricultural Agent, read some news about it being popular among Central/South American immigrants, as well as having some health benefits being touted on daytime television talk shows.

Our research, by chance, showed we could grow it adequately on white plastic, but not black, in our South Jersey hot, dry, sandy soils, and that it produces prolifically in our cooler, heavier soils in the northern part of the state. Costs of production looked good, and Pete worked with the Food Science Department to do some taste evaluations and recipe development.

What we didn't find were any enthusiastic immigrant communities clamoring for it. And apparently, few health/foodie consumers who frequent farmers markets had heard the news about its healthy prebiotic qualities.

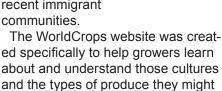
The handful of farmers who experimented with us ended up with a lot

of leftovers at the end of the season.

Useful Market Research Tools

There have been a few tools created to help determine market potential for new crops, especially if they happen to be popular in recent immigrant communities.

seek.



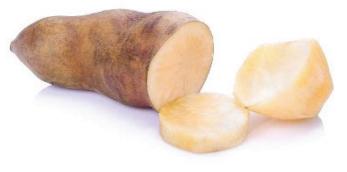
Researchers are conducting additional work to link those crops with census data. That includes highlighting the ethnic makeup of the communities around your market. We've piloted this for New Jersey and may expand it if successful. You can find more information on this at SARE. Rutgers.edu/market-research.html.

Similarly, the national Market Maker system, which is available in states that have subscribed to the service, helps you identify potential buyers of specialty crops and livestock products.

Check into Crop Prices

High retail prices for new types of produce don't necessarily translate into high prices to the grower either. What makes prices for new produce so expensive? A range of things. Such as novelty crops, short shelf life, special handling requirements, and small supplies available only from a few growers/wholesalers for a short period.

In some cases, there is so much unmet demand that there's lots of room to jump on an opportunity. However, flooding a tiny niche market with a



large, new supply is often self-defeating with the market being unable to absorb any more volume, no matter how low the price drops.

Keep in mind that a new crop alternative that looks like a lucrative opportunity is likely already a staple crop for other growers somewhere.

Where to Find Production Tips

Once you've decided you want to try a new crop, you have a wealth of production resources to tap into.

Check with your local and state extension offices, USDA programs, and grower organizations. You'll find how-to production guides and descriptions for new, unusual, and alternative crops. These support materials will help you learn how to grow them.

Many researchers and Extension advisers have tested varieties, fertility and seeding rates, and other production traits to see if a new crop will grow in their locale. Collaborating with colleagues in the Ag Economics departments, we try to determine costs of production to see if the crop can be grown profitably.

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Cleaning & Sanitizing GH

Dr. Gauthier, University of Kentucky

anitizing surfaces is a critical step for greenhouse and nursery sanitation. Pathogens that cause plant disease can survive in debris, in soil, or on surfaces. Cleaning and sanitizing greenhouses, benches, containers, and tools are important steps in eliminating microscopic propagules that can cause disease in subsequent crops.

Greenhouses and nursery pads should be fallowed (emptied) after each crop cycle or at least once per year for cleaning and sanitizing. Begin by removing weeds, carryover crops, and other potential reservoir hosts. Next. clean and sanitize all surfaces (greenhouse sidewalls, floors, and benches; containers; tools; equipment; irrigation lines) in order to inactivate any remaining propagules.

Cleaning Steps

Steps to cleaning containers, equipment, and surfaces include the following:

- Sweep or brush floors and surfaces to eliminate dry debris and soil particles.
- Wash surfaces. Use a brush and heavy stream of water to dislodge large particles. Follow up with soap or detergent. Tools, containers, benches, and equipment should be brushed or rubbed to clean surfaces. Note: Organic regulations indicate that soaps cannot come into contact with food products.
- Rinse away detergent and debris. Repeat steps 1 to 3 until all surfaces are clean.
- Sanitize surfaces, especially if disease was a problem for previous crops. The key to effective disinfection is the length of time the product contacts surfaces; slow-drying increases contact time and optimizes effectiveness. Commercial products

- are formulated and tested for stability, residual activity, safety, and sensitivity. Refer to label for specific instructions.
- Flush irrigation lines with disinfectant to remove propagules that may have moved into water lines and emitters.

Sanitizers and Disinfectants

Commercial products are recommended for efficacy. The following is a summary, only; refer to product labels for detailed instructions.

Hydrogen dioxide (ZeroTol® 2.0, Oxidate® 2.0) – effective against algae, bacteria, and fungi; contact time 1 to 10 minutes; use on containers, greenhouse walls and floors, foot baths, tools; use with a foaming agent for vertical surfaces (OMRI listed).

Hydrogen peroxide & peroxyacetic acid (Sanidate 5.0®) - effective against algae, bacteria, and fundi: contact time 1 to 10 minutes; use on containers, greenhouse walls and floors, foot baths, tools; use with a foaming agent for vertical surfaces (OMRI listed).

Quaternary ammonium compounds (Green-Shield®, Physan 20®, and KleenGrow™) -effective against algae, bacterial, fungi, viruses; contact time 10 to 15 minutes; residual activity several hours: use on containers. cooling pads, greenhouse walls and floors, foot baths, irrigation lines, tools; foaming formulation

Chlorine bleach (10% to 20% dilution) – extremely effective against algae, bacteria, fungi, and viruses; contact time less than 1 minute to 15 minutes; most effective product for use on porous surfaces such as wood, especially at higher concentrations; highly corrosive to metals; damaging to soft plastics and rubbers; dangerous to human health; never mix bleach with products containing ammonia or acidic products; half-life 2 hours.

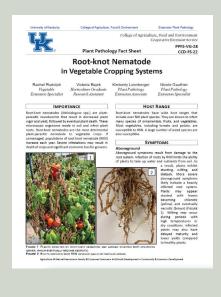


Root-knot Nematode in Vegetable **Cropping Systems (PPFS-VG-28)**

Root-knot nematodes are microscopic plant parasitic roundworms that reside in soil and infect plant roots. Unmanaged populations can result in significant economic losses for growers due to decreased plant vigor and yield, followed by plant death. Rootknot nematodes can infect over 500 plant species, including many ornamentals, fruits, and vegetables.

This Extension publication focuses on the disease as it affects commercial fields and high tunnels. Host range, symptoms, cause, nematode life cycle and infection, and management options are discussed. A table of selected plant cultivars and their root knot nematode host status (nonhost, resistant, or susceptible) is also included.

Contact the Christian County Extension office to request a free copy -(270) 886-6328



Strategies For Toxic Fescue

Mike Rankin, Kentucky Forage News, 9.6.23

f you have pastures containing toxic fescue, consider implementing one or more of the laundry list of mitigation strategies that will reduce, but not eliminate, the effects of toxic Kentucky-31. As I travel to farms throughout the Fescue Belt, these are the most common approaches encountered.

Late-fall/winter calving: This helps avoid putting the breeding season square in the middle of the time when heat and toxicity both reach a crescendo. It also often means that purchased supplements and hay will be needed to carry lactating cows over until green grass appears again. These systems run counter to the natural animal-forage interface.

Legume interseeding: This falls under the larger heading of dilution being the solution, although legumes can be beneficial in any forage stand. Red clover is an especially effective legume to help offset the impacts of fescue toxicosis, but any clovers are better than no clovers. Be vigilant about routinely seeding legumes into toxic fescue pastures so there's never a gap.

Supplementation: Research has verified that feed supplementation is an effective means of mitigating fescue toxicosis, and I have been on several beef operations where this strategy appears to be working to the extent that it can. Supplements such as distillers grains, corn gluten feed, or soy hulls are commonly used. Further improvements in performance can be realized when they're coupled with the use of an ear implant containing a growth-promoting steroid hormone. Research at KY USDA-ARS measured a 70% improvement in average daily gains with the combination of soy hulls and steroid implants compared to pasture-only cattle. Of course, these supplements likely wouldn't be needed if cattle were off toxic fescue.

Minerals: Free-choice mineral available to cattle is always important, but

especially for animals on toxic fescue pastures during the hot days of summer. Compounds that contribute to fescue toxicosis bind to micro minerals such as zinc and copper, reducing the toxic effects to the animal. Avoid feeding trace mineralized salt in place of free-choice minerals or try to cut consumption of the mineral mix by adding salt.

Seedhead suppression/removal: Given the relatively high toxicity of fescue seedheads, it makes sense to keep cattle from consuming them. This can effectively be done with chemical suppression, but it comes with chemical and yield costs. Me-

chanical removal of seedheads with a mower is also an option, but this isn't easily accomplished. Timed rotational grazing to let the cows remove grass growing points before they emerge is another option, but this is difficult to do across a large number of acres.

Stockpile forage: Stockpiling forage, in general, is an effective means of lengthening the grazing season. Stockpiled tall fescue is especially effective because of its ability to grow in the fall, and toxicity levels decline from late fall into the next spring. However, don't graze stockpiled tall fescue too short, as stem bases can have a high concentration of toxic endophytes during the fall.

Seed something else:
This is perhaps the most effective approach to avoiding the evils of toxic fescue when it's at its worst. With growing frequency, farmers are seeding either summer annual or warm-season grasses to have a place to go with the cow herd during the scorching days of summer. Both options offer

a nontoxic alternative with high forage yields. This strategy even makes good sense for those farms with a novel endophyte tall fescue base.

A Better Approach

All of the above mitigation strategies don't eliminate the impacts of toxic tall fescue, they merely reduce them to various degrees. Conversion to novel tall fescue varieties is the only way to put the problem in the rearview mirror. I've heard all of the reasons why this can't be done, but they don't change the fact that profits will continue to suffer if toxic fescue continues to anchor the forage base.



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Don't Miss Opportunities in this High Market

Kevin Larent, University of Kentucky

s we approach the end of summer and nighttime temperatures begin to consistently dip into the 60's our thoughts turn to fall activities, one of which is marketing our spring born calves.

It's quite easy to feel good about the cattle business these days with current market prices, however we need to make sure we continue to manage our calf crop and do not miss the opportunities this current market is offering. Good management pays dividends in both lean years and good years. In fact, one could make the case that good management pays even greater dividends in times like these. The following are four management considerations that will help maximize calf value at sale time.

Avoid selling bulls.

Table 1 compares steer and bull prices in Kentucky markets for the week of 8/6/2023 to 8/12/2023.

Weight	Steer Price	Bull Price	Discount	Discount
Lbs	\$/Cwt	\$/Cwt	\$/Cwt	\$/Head
375	260.00	260.77	0.77	2.89
425	260.58	251.87	-8.71	-37.02
475	259.59	247.18	-12.41	-58.95
525	252.83	234.74	-18.09	-94.97
575	258.39	232.02	-26.37	-151.63
625	252.18	219.98	-32.20	-201.25
675	249.34	213.89	-35.45	-239.29

As is usually the case, discounts for bulls increase as calves move up in weight class. What is unusual is the severity of the current discounts. Bull calves weighing in the 500-600 lb weight range have historically taken a \$10-12 per cwt. discount as compared to similar weight steers. However, the present discounts for that weight bull calf have been running in the \$20+/ cwt. range. As table 1 shows, during the week of 8/6/2023-8/12/2023 that amounted to \$95-152 per head. Although it is best to castrate male

calves prior to three months of age, the next best option is to castrate prior to weaning. Research also shows that if calves are castrated early and implanted, weaning weights will be similar to intact males at weaning. A good reason does not exist to leaving a male calf intact. Castration is something that must be done and should be done on the farm where the calf was born to avoid the most stress and add the most value.

Wean, feed, and take advantage of the current value of gain.

Weaned lots of calves have been consistently selling at a premium to unweaned calves. Weighted average premiums in two recent CPH sales were \$10.45/cwt over state average prices with premiums as high as \$20/cwt for lighter weight heifers. But what is most promising is the current value of gain being offered in the market-place. Table 2 shows the current value in dollars per head of each additional 100 lbs. of weight.

Weight	Steer Price	Steer Price	Additional Value	Max. Cost of gain
Lbs	\$/Cwt	\$/Head	\$/Head	\$/lb
375	260.00	975.00		
475	259.59	1233.05	258.05	2.58
575	258.39	1485.74	252.69	2.53
675	249.34	1683.05	197.30	1.97
775	230.28	1784.67	101.63	1.02
875	233.06	2039.28	254.61	2.55

By simply dividing that dollar amount by 100 you can calculate the maximum cost of gain that a feeding program must stay under to be profitable. You can see that there is an excellent opportunity to profitably add weight to calves, especially at the lighter weight classes. Lighter weight calves are also cheaper to feed and have a lower cost of gain than bigger calves due simply to less feed needed for body maintenance. Backgrounding/preconditioning budgets using \$300/ton feed, \$90 hay, 8% interest, and \$15/head health costs along with 2-2.5 average

daily gains are currently showing cost of gain figures of approximately \$1.10/ lb. for 375-575 lb. calves to upwards of a \$1.50/lb. for 775-875 wt. cattle. Realize, these price figures are from the non-valued added portion of the market report and do not represent any premium for weaning. The best way for small producers to capture weaned calf premiums is to sell in special preconditioned sales such as CPH or other stockyard sponsored sales. Combining a weaned calf premium with a feeding program that captures current value of gain leaves room for a potential significant profit.

Consider a pre-weaning working.

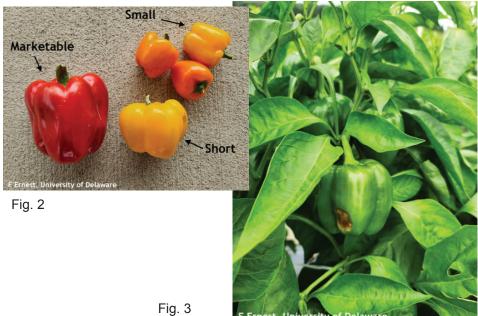
Working calves prior to weaning has always been a standard recommendation, especially for calves that were going to be retained on the farm through a pre-conditioning program. With current market prices, this may be a profitable strategy even for calves that will be sold off the cow. Virginia Tech research showed a 10-40 lb response in added weaning weight by deworming and implanting calves in mid-summer. If it is early September and we know we will not sell for another 45-60 days (about 2 months) it may pay dividends to deworm, implant and boost fly control now. If these practices add an additional 20 lbs of sale weight given the current market prices, a \$10 investment may net a \$40 return.

Avoid excessive sale day shrink.

Sale day shrink is simply a cost of doing business. Anytime we move or haul cattle we can expect at least a 2-3 % reduction in weight primarily due to fill. However, with every pound worth \$2+ dollars, reducing excess shrink needs to be a consideration. Oklahoma State research showed that unweaned bawling calves hauled to the sale barn the night before sale day shrank approximately 2% more

continued from page 1

plant as early as possible so that they do not compete for resources with fruit that have potential to be marketable (Figure 3). Bell pepper plants tend not to abort fruit that has survived 14 days post pollination, even after significant damage. Pepper fruit that have a short, flattened appearance early in development will not develop a marketable shape later and should be removed. Pepper fruit that have begun to ripen will not grow larger so undersized peppers that begin to change color should also be removed.



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than similar calves delivered on sale day. Sometimes delivering calves the night before a sale cannot be avoided but be mindful that a fresh weaned bawling calf in a hay and water pen at the yard the night before the sale is not going to eat or drink very much, if at all. Some other considerations to reduce shrink are to improve facilities so cattle can be sorted and loaded

quietly and efficiently just prior to hauling. Also consider hauling calves early to the yard to avoid long waits in line to unload. Although excessive shrink should be avoided, overfilling calves should also be avoided. Selling calves that are deliberately overfilled is not fair to buyers and can also affect the health of calves in transit. Most of the time this strategy backfires on the

seller in the way of price discounts.

However you plan to market your calves this year, prices should be favorable. But there is nothing wrong with trying to maximize value and get paid a little extra for all your hard work and efforts.

