



CROP, DAIRY, LIVESTOCK, & EQUINE NEWSLETTER

Volume 22 : Number 3

Fall 2020

Table of Content

Announcements	1
Testing Soil for Meaningful Results	2
Pasture, Rangeland and Forage (PRF)	
Insurance for Drought Protection	3
USDA - Farm Service Agency Programs	4
Extending the grazing season in New England	5-7
Feasibility of Growing Saffron in Massachusetts	8-12
Toxicity from Fall Leaves	13
Grazing & Forage Season Extension: Recorded Webinar Online	14

Announcements

Webinar: Testing Soil for Meaningful Results

With Dr. Hashemi & Dr. Corcoran

Date: October 23 at 12pm

More information on page 2

Grazing & Forage Season Extension: Recorded Webinar Online

More information on page 14

Editor,

Masoud Hashemi

Extension Professor



Image: Mt. Sugar Loaf in the Fall

Photo Credit: Masoud Hashemi



With Dr. Masoud Hashemi & Dr. Sam Corcoran

Date: October 23rd, 2020

Time: 12:00 pm EST

What will be covered?

- Benefits of testing soil for fertility
- Overview of how to correctly sample soil
- Interpreting soil test results

This webinar is beneficial to all field/vegetable farms, managing pastures in equine and livestock operations, and backyard growers.

To Register: Follow the link below to sign up for this webinar.

https://register.gotowebinar.com/register/86021461784051612_29

Pasture, Rangeland and Forage (PRF) Insurance for Drought Protection

Deadline: November 15, 2020

Are you a livestock and/or hay producer who suffered losses to your hay and pasture crops in 2020? If so, you might want to take a close look at the Pasture, Rangeland and Forage (PRF) policy available through Federal Crop Insurance. A PRF policy can provide livestock and hay producers with protection against drought. PRF is a single peril policy that is designed to provide protection based on rainfall amounts on your hay and pasture land in two month periods. A grower can insure up to 100% of their pasture and hay acres at a productivity factor from 60% to 150% of the county base value. This production will be distributed in 2 month intervals as determined by the grower. If precipitation falls below the selected trigger level during the 2-month period, your crop insurance company will issue an indemnity payment based on the % of production selected for that period.

The Rainfall Index uses NOAA data for roughly a 17 X 17-mile grid that encompasses the location of your hay and pastureland. Your crop insurance agent can provide you with historical rainfall data for your grid(s) along with historical data that shows what you would have received if you had purchased a PRF policy for a given crop year.

The deadline to purchase a PRF policy for the 2021 crop year is **November 15, 2020**.

Benefits of a PRF policy:

- Relatively inexpensive cost per acre
- No requirement to maintain production records
- No need to report crop losses, payments are automatically issued if triggers are met
- You do not have to insure all of your hay and pasture acres (unlike traditional yield based policies),

The PRF policy, as well as all Federal Crop Insurance policies, are sold and serviced by private crop insurance agents. A list of crop insurance agents is available at all USDA Service Centers or on the RMA website at: <https://prodwebnlb.rma.usda.gov/apps/AgentLocator/#/>

Note: Yield based coverage on hay is available through the Noninsured Crop Disaster Assistance Program (NAP) administered by the USDA - Farm Service Agency (FSA). To learn more, contact the USDA-FSA Office that serves your farming operation.

This material is based upon work supported by USDA/NIFA under Award Number 2018-70027-28588. UMass Extension works in partnership with the USDA National Institute of Food and Agriculture and the Northeast Extension Risk Management Education Center to educate Massachusetts producers about Federal Crop Insurance and USDA Disaster Assistance Programs. For more information, please contact UMass Risk Management Specialists Paul Russell at pmrus-sell@umass.edu or Tom Smiarowski at tsmiarowski@umass.edu



USDA – Farm Service Agency Programs

Emergency Assistance for Livestock, Honeybees and Farm-Raised Fish Program (ELAP)

ELAP provides assistance for livestock feed and grazing losses that are not due to drought or wildfires on federally managed lands; losses resulting from the cost of transporting water to livestock due to an eligible drought; losses resulting from the additional cost associated with gathering livestock for treatment and/or inspection related to cattle tick fever, honeybee feed, colony and hive losses; and farm-raised fish feed and death losses.

Emergency Conservation Program (ECP)

ECP provides emergency funding and technical assistance to farmers to rehabilitate farmland and conservation structures damaged by natural disasters and implement emergency water conservation measures in periods of severe drought.

Livestock Forage Disaster Program (LFP)

LFP provides payments to eligible livestock owners and contract growers who have covered livestock and who are also producers of grazed forage crop acreage (native and improved pasture land with permanent vegetative cover or certain crops planted specifically for grazing) that have suffered a loss of grazed forage due to a qualifying drought during the normal grazing period for the county.

Coronavirus Food Assistance Program 2 (CFAP 2)

CFAP 2 provides vital financial assistance to agricultural producers who continue to face market disruptions and associated costs because of COVID-19. Producers of specified agricultural commodities who face continuing market disruptions and significant marketing costs are eligible for CFAP 2 payments. FSA is accepting applications for CFAP 2 from **September 21, 2020**, to **December 11, 2020**.

For more information on these or other FSA programs, please contact your local FSA county office or visit farmers.gov/



Extending the grazing season in New England

Arthur Siller and Masoud Hashemi

In a changing climate, northeast farmers are experiencing milder/wetter winters and hotter/drier summers, significantly impacting pasture productivity. Wet soils in spring may delay planting of long season annuals like corn while changes in summer conditions may intensify the summer slump of pastures. Grazing in New England is also limited in late fall. To avoid overgrazing, livestock producers heavily rely on labor-intensive and more expensive stored hay and/or purchased feed. These approaches can strain farm finances since livestock producers and dairy farmers operate on thin profit margins. Not surprisingly, we have found that producers throughout the region are highly interested in expanding the grazing season and more risk mitigating strategies.

On our research stations, three northeastern states (MA, ME, and VT) are investigating several novel extended grazing systems to increase forage inventory, farm profits, and climate adaptability funded by Northeast SARE. These strategies will provide research and education to help livestock farmers confidently increase yield, produce high-quality forage, and replace stored feeds.

Stockpiling: Stockpile grazing, also known as deferred grazing, is a forage management technique where forage is fertilized in late summer, then allowed to accumulate dry matter until early winter. Stockpiling is not a new concept and has been practiced as a common strategy to extend grazing season, especially by livestock producers in the U.S. South and Midwest. The use of tall fescue for winter grazing is productive due to its persistence in various unfavorable soil and climate conditions. Tall fescue continues its growth through late fall and maintains its quality during late fall and winter, until the palatability and nutritional value declines due to the weight of the snow, ice, and wind and increasing leaf rot and decay. However, in general, dry matter intake and, thus, performance of livestock that utilize stockpiled tall fescue is lower than would be expected. The inferior nutritional value of stockpiled tall fescue can be improved by increasing its protein content. Animals will respond to energy supplementation when forage CP is greater than 14%. Fescue responds well to nitrogen fertilization, which can significantly improve its yield and protein content. Integrating legumes such as red clover into tall fescue-based stockpiles may partially meet the nitrogen needs of tall fescue and improve palatability and dry matter intake of the mixed forage by livestock.

No-till small grains into pastures: By planting annual cover crop forages into existing perennial pastures, the benefits of these crops can be combined. Cover crops are primarily used for the wide array of ecosystem services. However, they can also provide an economic service – paying for themselves and offering net profit – if they are grazed or harvested as a source of animal forage. These dual-purpose cover crops (DPCC) provide an additional avenue of on-farm forage production, increase crop diversity, and reduce reliance on the crop performance of hay or silage as a primary source of feed. DPCC are desirable for their contribution to early spring forage production as well as for grazing season extension in the fall. They also offer animal production systems a crop that can use manure when cash crops are absent, preventing nitrogen leaching. Since much of the land on New England livestock farms is best suited for perennial forages, we suggest planting these crops into dormant pasturelands, increasing forage inventory with minimal management complexity and without the need for additional cropland.

Cool-season brassica mixtures: Another late fall and early winter grazing opportunity is presented by forage brassicas. Although they are not widely used in New England, brassicas have a long history as a livestock forage and modern breeding programs have produced improved forage varieties available through farm seed suppliers. In some ways, brassicas are an ideal fall forage for regional meat and dairy producers. They are quick growing, nutritious crops that can benefit the farm system in many ways. Many brassicas grow long tap roots, suppress fall weeds, effectively soak up excess nitrogen, and beneficially impact the soil microbial ecosystem. Additionally, where brassicas winterkill, nitrogen is readily available for spring crops and also allow an extra step in forage rotations mitigating the build-up of grass and legume pests and diseases.

However, brassica forages present unique challenges for livestock and dairy farmers. Unfortunately, the low dry-matter content of brassicas makes the crops inappropriate for hay or silage. Furthermore, anti-quality components can be detrimental to animal health and there is concern about off flavors coming through in milk or meat when animals are pastured on brassica forages immediately before milking or slaughter.

While these are significant issues for brassica forage use, no forage is without complications and management techniques have proved effective at preventing serious issues in animal health. Livestock should be introduced gradually to brassica pasture due to the richness of the forage and, by grazing a mixture of a brassica and a high-fiber crop like oats, farmers can effectively mitigate anti-quality concerns. To mitigate potential off flavors, many reports suggest withdrawing animals from brassica pastures several hours before milking and as much as a week before slaughter for meat.

Warm-season annuals: While winter grazing presents the biggest opportunity to improve the forage inventory on New England farms, the summer can be challenging for farmers as well. All currently recommended species of cool-season perennial grasses show slow growth between mid-June till mid-late August. Defoliation stress combined with severe soil moisture depletion and high temperatures during summer dramatically reduce the growth and persistence of cool-season forage species. Wet springs and additional summer droughts under climate change conditions are also predicted to limit the yield of long-season corn silage and the widespread cool-season grass-legume pastures. Due to the lack of high-quality forage available compared to early spring, August becomes one of the toughest grazing months. The right pasture/grazing management should include alternative strategies to compensate for low forage inventory during summer slump and fall to reduce the cost of purchase/stored feed and to avoid potential overgrazing. Quick-growing and drought-tolerant summer grasses have grown well in dry conditions. They can also benefit crop rotations by suppressing weeds, capturing residual nitrogen, and diversifying harvest timing.

Despite their obvious positive characteristics, summer grasses present several challenges. Sorghum and sudangrass contain prussic acid and must be managed to prevent livestock poisoning and are inappropriate for horses. While pearl millet and crabgrass do not share these issues, they require substantial nitrogen fertilizer to produce high-quality forage. There is also considerable variation between varieties in terms of forage quality.

A mixed-species summer forage including legumes or other forbs would ameliorate these quality issues. Soybean, cowpea, sunn hemp, and clovers have produced high-quality forages and species mixtures can produce a more balanced, reliable forage than either grass or legume alone. However, to achieve good results in terms of forage production, weed suppression, crop establishment, and management flexibility, proper species selection is very important. This project hopes to bring these crops into New England forage systems by performing research into specific combinations and their management is needed.

Overall, these grazing extension strategies show promise in the Northeast U.S. Environmental resiliency and economic profitability will only become more difficult for livestock and dairy farms as climate change effects multiply. We hope to use this research to develop new tools for farmers to meet these challenges.

We are looking for farmers who are interested in trying out these techniques on their farms. Please reach out to Arthur Siller (asiller@umass.edu) if you have ideas about these strategies, want to learn more about our research as it progresses, or are interested in collaborating on this research! Farmers-collaborators will be compensated for their time and land for the implementation of on-farm research.

Feasibility of Growing Saffron in Massachusetts

Leila Tabrizi and Masoud Hashemi

Saffron (*Crocus sativus* L., Iridaceae) is considered the world's most expensive spice with a high economic value. It plays a crucial role in many small farmers' economy in countries such as Iran, India, Afghanistan, Greece, Morocco, Spain, and Italy. The global production of saffron is around 418 tons annually on about 250,000 acres. More recently, saffron cultivation has been expanded around the world, from New Zealand to New England.

The dried red stigma of *C. sativus* flower is commonly referred to as saffron. It has diverse use in food and beverage (for tasting, flavoring, and coloring), pharmaceutical, and cosmetic industries. Saffron's quality and efficacy depend on the concentration of three primary metabolites in its dried stigma. These compounds include color (crocin as a carotenoid pigment), aroma (safranal as a terpene aldehyde), and flavor (picrocrocin as a bitter taste monoterpene glucoside). Saffron active constituents are known as possible candidates to prevent and treat Alzheimer's, Parkinson's, depression, cardiovascular, respiration, and digestion system disorders. Additionally, it is recognized for reducing fat and blood sugar, antioxidant, anti-cancer, anti-inflammatory, anti-microbial, and immune-regulatory properties.

There is a growing interest in introducing saffron to the growers in non-traditional saffron production areas. Due to its unique biological, physiological, and agronomic characteristics, saffron can be grown in marginal land with minimum input, including irrigation water, fertilizer, and chemicals for controlling pests and pathogens. However, the cultivation of saffron in new areas to the crop requires a realistic evaluation of the feasibility of an economical and sustainability point of view.

Its corm (similar to the bulb) propagates saffron. Mother corms generate new corms annually and trickle gradually by replacement corms growth during the growing season. Replacement corms are potential mother corm in the following growing season.

The life cycle of saffron is different from common crops. Saffron is an autumn flowering plant and then remains dormant during summer. Temperature is the key environmental factor that regulates most physiological processes and developmental changes, especially saffron's flowering behavior. Its biological life cycle begins with flower and leaf emergence during fall and ends with replacement corms formation during spring. In general, the flowering period will start 60-90 days after corm planting, depending on planting date and climatic condition. The vegetative growth period takes approximately 220 days per year (Figure 1). Saffron leaves appear immediately after flowering, and in some cases, the appearance of both leaves and flowers from the soil coincide.

Feasibility of Growing Saffron in Massachusetts

Leila Tabrizi and Masoud Hashemi



Figure 1. Growth stages of annual cycle of saffron. It starts as corm (top left) and ends as residue (bottom right)

Climate and soil

Climatic conditions such as temperature, rainfall, radiation, and freezing during the critical growth stage (October-November) are essential in saffron production. Saffron is known for its adaptability to hot and drought conditions. The temperature tolerance threshold of saffron is almost in the range of minimum -18 to -22 °C (≈ -0.4 to -7.6 °F) and maximum 35 - 40 °C (95 - 104 °F). Saffron begins its life cycle in the cold season, which also demonstrates its cold resistant. However, heavy snow and freezing temperatures during flowering may cause flower decay and reducing flower production, as flowers are more sensitive to snow damage than leaves. In general, rain in autumn, sunny condition, warm summer, and chilly winter temperature is preferred during the saffron growing period.

Although saffron can be grown on a wide range of soil textures, the crop performs best in soils with light to medium texture, sufficient drainage, and high organic matter. Heavy clay and not well-drained soils may cause fungal disease and decay of the corms. The optimum soil pH is in the range of 6.0-8.0.

Agronomic management

For appropriate planting beds, the field should be tilled to the depth of 10-12 inches. The crop responds better to organic fertilizers, including manure and compost, than synthetic fertilizers. The mother corms with the proper weight of at least 8g are suitable for planting in the depth of 6-8 inches in planting rows or beds. Saffron corms can be planted from July until mid-September. The nutrient reserve in the mother corms is essential for successful plant establishment, flowering, and early growth; therefore, larger corms are preferable. The optimum inter and intra planting distance of 6 by 6 or 6 by 4 inches is recommended. Irrigation in areas such as Massachusetts with sufficient precipitation is not required.

New corms are formed in the saffron field on the older mother corms after flowering, so replacement corms will move each year upward and become closer to the soil surface. Therefore, deep planting of corms is recommended to prevent replacement corms from being formed in the soil surface. Deep planting (about 6 inches) maintains farm productivity for many years to come. Optimum planting depth not only provides better conditions for flower and leaf emergence, but it is also essential in protecting corms from freezing and heat stresses during winter and summer, respectively. However, planting too deep may disrupt flower emergence and reduced productivity.



Figure 2. Overview of traditional saffron field during flowering stage (late October).

Flower harvest

Harvesting saffron is commonly done by handpicking; therefore is a labor-intensive task. Flowers form close to the land surface and may be surrounded by several leaves. Thus, caution must be made to prevent damaging the leaves during harvesting flowers. Generally, the flowering period takes 2-4 weeks, and harvest time may vary from mid-October to mid-November, depending on climatic conditions. The saffron flower's shelf life is short (3-4 days) and must be picked when flowers are not fully opened in the early morning (Figure 3). This helps in preserving the quality of stigma. It is better to keep the harvested flowers in baskets with proper aeration and avoid stacking a large volume of flowers. After harvesting, the stigma should be separated from other flower parts in a short period.



Figure 3. Flower ready for harvest (left) and separated stigma (right).

In general, saffron flowering has a direct relationship with a low temperature in the fall. The earlier temperature decrease in autumn, the sooner flowering occurs. Saffron yield is usually low in the first year, and stigma yield increases in the second year. However, fields older than 4-5 years (or maximum 6-7 years in some regions) may not be economical due to the high number of corms formed in the soil, causing competition for water and nutrients, fungal infection, and decreasing size and production ability of corms.

Postharvest processing

Drying methods and storage conditions determine the stability of saffron, which directly affects its market value. Drying must be done correctly to maintain saffron color, aroma, and taste.

Two standard saffron dehydration methods include 1- traditional (sun drying, dark-air drying, toasting), and 2- advanced (using an electric oven, vacuum oven, freeze-drying, microwave, etc.). The main difference between these two methods is the temperature applied during the drying process.

Also, saffron should be stored in suitable containers (preferably glass containers), dark conditions, low temperatures (about 5-10 °C \approx 40-50 °F) because its secondary metabolites are sensitive to light and temperature.

References:

- Alonso, G.L., Arghittu, A., Astraka, K., Betza, T., Camba, E., Canadas, W., Carmona, M., Cillocco, M.T., Corona, J., Curreli, M. et al., 2007. White Book - Saffron in Europe. Problems and strategies for improving the quality and strength competitiveness. Available in <http://www.europeansaffron.eu/archivos/Whitebookenglish.pdf>
- Carmona Delgado, M., Zalacain Aramburu, A. and Alonso Diaz-Marta, G.L. 2006. The chemical composition of Saffron: Color, taste and aroma. Imprenta Junquera S.L. Pub., Albaceta, Spain.
- Gresta, F., Lombardo, G.M., Siracusa, L. and Ruberto, G. 2008. Saffron, an alternative crop for sustainable agricultural systems. A review. *Agronomy for Sustainable Development*. 28, 95–112.
- Koocheki and Khajeh hosseini. 2020. *Saffron: Science, Technology and Health*. Elsevier Pub. 580 P.
- Lopez-Corcoles, H., Brasa-Ramos, A., Montero-García, F., Romero-Valverde, M. and Montero-Riquelme, F. 2015. Phenological growth stages of saffron plant (*Crocus sativus* L.) according to the BBCH Scale. *Spanish Journal of Agricultural Research*. 13(3), e09SC01.

Ask the Expert: Toxicity from Fall Leaves

Jessica Prigge, BS, UMN and Krishona Martinson, PhD, UMN

From: October 2020 UMN Extension Horse e-Newsletter

Question: Between trail rides through the woods and wooded pastures, my horses are around a lot of fallen leaves in the fall. What leaves should I look out for?

Response: As fall progresses and pastures begin to go dormant, fallen leaves could seem appetizing to some horses. Unfortunately, some leaves are toxic, including [wilted maple leaves](#) and fresh and wilted [cherry](#) leaves. Symptoms from consuming these leaves include red or brown urine and death, respectively. Although more of a summer issue, consumption of female [boxelder seeds](#) (e.g. samaras or “whirlybirds”) can cause seasonal pasture myopathy which can lead to death.



Photo credit: Krishona Martinson, PhD, UMN

Fortunately, horses rarely consume wilted leaves. Most toxicity is seen when horses are left on over-grazed pasture without supplementing hay as hungry horse start consuming things they normally wouldn't. Watching horses closely in the fall, supplementing hay when pastures begin to go dormant, and pulling horses off pastures during fall leaf shed are common strategies to reduce the risk of fall leaf toxicity. Most agree that wilted or fallen leaves are not toxic after going through a winter (e.g. the following spring).

Other tree-related toxicity issues include housing horses on shavings from [black walnut](#) and when horses consume [green acorns](#) from oaks. Fallen leaves from these trees are not normally associated with toxicity.

Webinar Series: Grazing & Forage Season Extension



Recorded and now available to view online.

Summer Annuals with Caleb Goossen of MOFGA

<https://ag.umass.edu/crops-dairy-livestock-equine/videos/grazing-forage-season-extension-webinar-series-summer-annuals-with-caleb-goossen-of-mofga>

No-Till Pasture Improvement with Rick Kersbergen of UMaine Extension

<https://ag.umass.edu/cafe/videos/grazing-forage-season-extension-webinar-series-improving-pastures-with-no-till-methods-with-rick>

Brassicas and other cool-season annuals with Heather Darby of UVM Extension

<https://ag.umass.edu/crops-dairy-livestock-equine/videos/brassicas-other-cool-season-annuals-with-heather-darby>

Stockpiling with Troy Bishopp: 60 Days From Your Fall Feeding Plan

<https://ag.umass.edu/crops-dairy-livestock-equine/videos/stockpiling-with-troy-bishopp-60-days-from-your-fall-feeding-plan>

The series is a collaboration among UMass Extension, UVM Extension, & UMaine Extension, and is supported in part by a Northeast SARE Research and Education Grant with organization and administration supported by the Livestock Institute of Southern New England via the New England Grazing Network with the support of the Cedar Tree Foundation.

For any questions about the series, please contact Sam Corcoran at sglazecorcor@umass.edu

