

# K-STATE

Research and Extension

## Sunflower Extension District #6



### May 2023

Go to [www.sunflower.ksu.edu](http://www.sunflower.ksu.edu) for more details on these programs.

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May 2023  
Newsletter



[www.sunflower.ksu.edu](http://www.sunflower.ksu.edu)

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## Project Learning Day

### Cheyenne County



### Wallace County





## How Temperature Inversions Can Affect Herbicide Applications

When we are spraying crops, our goal is to get herbicide on the target field and weeds. However, off-target movement can result in herbicide damage on neighboring plants. One way pesticides can move off-target is through air temperature inversions.

### What is an inversion?

An air inversion is when the air closest to the ground is cooler, denser and heavier than the air above it. This typically happens toward the end of the day, as the soil cools off because of less heat from the sun. As the soil cools off, it cools off the air close to it. And as a general rule, cool air will always sink - settling into low areas. In addition, because of denser air near the surface, the air can only move only horizontally within the inversion.

### How does an inversion affect herbicide applications?

With any herbicide application, there will be a range of droplet sizes. The presence of an inversion will effectively trap the fine droplets near the ground in the cold air mass. These droplets will remain airborne and not reach the soil/plant surface. The droplets can move with the cold air mass and very light winds will gradually move the air mass horizontally into nearby areas. In addition, local influences (like trees, crops and buildings) will affect the wind and are likely to dictate the direction that the suspended herbicide droplets will drift.

### How are inversions affected by environmental factors?

**Wind Effects.** Inversions generally are stable enough to resist mixing action when wind speeds are less than 5 mph. As wind speed increases, inversions steadily are weakened and only weak ones will form.

**Cloud Effects.** In general, greater cloud cover causes slower surface cooling and slower inversion formation in late afternoon or evening. When skies are completely overcast, inversion formation tends to be weaker than on clear nights. Partly cloudy conditions can bring widely varying inversion conditions in the length of time the inversion lasts and in the area included in the inversion.

**Surface Dew or Frost and Fog.** Dew or frost formation often occurs when inversions are forming and, thus, should serve as a warning that an inversion may exist. Condensation results when the soil surface and air close to the surface cool. Fog appears when the air temperature cools to the dew point temperature. Because relative humidity is 100% in the fog and is very high in areas close to the foggy areas, little or no evaporation can occur. Pesticide droplets or volatilized particles will not evaporate and will move downwind.

**Effects of Surface Conditions.** More porous mulched surfaces will be hotter throughout the day because only a shallow surface layer of the mulch is heated. As a result, the overlying air

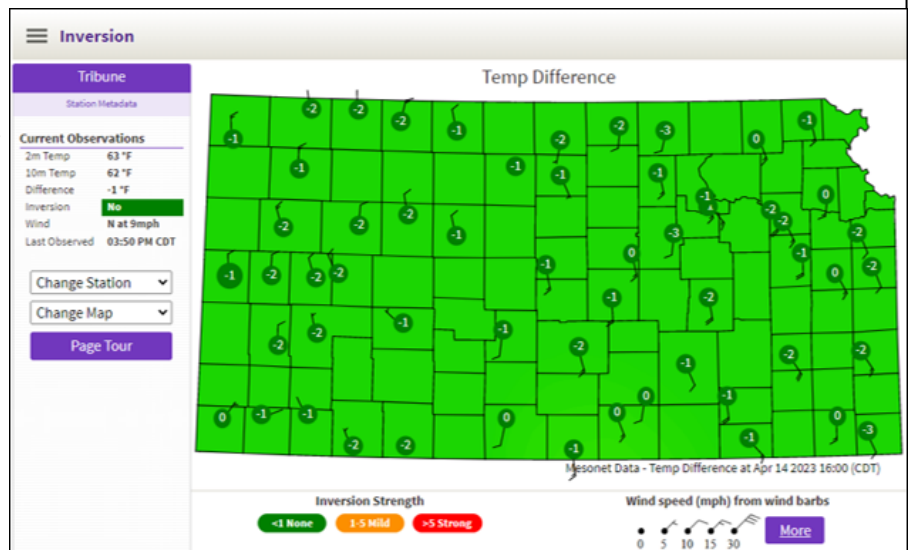
also will be hotter. Because little energy is stored under the mulched surface, its surface will be much colder than the denser soil surface. As a result, inversions form more rapidly over mulched or porous surfaces and also will be more intense.

**Water Content and Evaporation.** Cultivation can cause dry soil to act like mulch because it increases the soil's pore space, which decreases its thermal conductivity. Cultivation also causes moist soil to dry more quickly. The surface temperature of recently cultivated soil will be greater during the day and lower during the night, compared with an uncultivated soil. As a result, inversions will form more quickly and be more intense over the cultivated soil.

**Closed-Crop Canopy.** Plant leaves cool very rapidly because of their low heat capacity. The lower leaves and the soil surface remain warmer because they are protected from the clear sky by the upper leaves. Because the upper canopy leaves now are colder than the adjacent air, heat energy will be conducted from the warmer air to the cooler leaves, where it will be lost as terrestrial radiation. Because upper leaves have low heat capacity and their only heat source is the shaded leaves, they will cool to significantly lower temperatures than a bare-soil surface. Therefore, inversions over closed-crop canopies will form sooner in the evening and likely be more intense than those over a bare-soil surface.

### How to know when there is an inversion?

Check out the K-State mesonet ([www.mesonet.ksu.edu](http://www.mesonet.ksu.edu)). Specifically, use the agriculture tab and click on inversions ([www.mesonet.ksu.edu/agriculture/inversion](http://www.mesonet.ksu.edu/agriculture/inversion)) to find the map. Many of the weather stations have thermometers at 2 meters (6.5 ft) and 10 meters (32.8 ft). You can see the temperature difference between those heights to know if there is an inversion in place. Also the map shows the strength of the inversion, with green dots as no inversion, yellow as mild (1-5) and red as a strong inversion (>5).





## Mineral Supplementation

Mineral supplementation on any cattle operation is an important management practice to ensure proper growth, reproduction, and overall performance among other things. However, sometimes it can get confusing where to start. Cattle producers may stick with recommended product or what they have always used with little consideration for current production phase, feeding conditions, and goals. This is one of the challenges they face when determining what they will use the upcoming grazing season.

### Mineral intake and variability: Run the numbers

by Dale Blasi, stocker, forages, nutrition and management specialist

Pasture and supplemental feed inputs represent the lion's share of a beef producer's annual expenses and are an ideal starting place for initiating hard-nosed cost control measures. When environmental variation is combined with ever-changing animal nutrient requirements and pasture quality indices, lower feed costs represent a moving target that can only be bulls-eyed with appropriate planning and constant evaluation. An excellent starting place for many operations intent on maximizing return on investment is an evaluation of the existing pasture mineral supplement program.

The primary objectives for providing mineral supplements to grazing cattle is to meet nutrient requirements, provide a vehicle for delivering feed additives and improve grazing distribution. Generally, mineral supplements are designed to meet approximately 50% of a grazing animal's macro and trace mineral requirements when consumed in a two to four-ounce daily formulation and are specifically formulated for the nutrient requirements and intended objectives for various classes of grazing cattle (i.e. lactating beef cows grazing fescue vs stocker calves grazing native pasture).

The daily consumption of a mineral supplement provided free choice can be quite variable around the intended amount consumed of anticipated daily consumption. This is a consequence of environmental conditions, plant species and maturity, availability and palatability. Even more perplexing are the percentages of animals in a grazing group who, for whatever reason, do not partake in mineral consumption. For example, Bowman and Sowell (1997) summarized in a review article several studies that made direct comparisons between hand-fed (dry) and self-fed (block or liquid) supplements and reported an average of 5% and 19% non-feeders, respectively. Weibert et al. (2018) reported the weekly consumption of a complete mineral fed free choice with an intended daily consumption of three ounces per day ranged from a weekly average from a low of 2.33 ounces to a high of almost five ounces over the thirteen-week trial period. Over the entire 90-day trial, the average consumption was 3.27 ounces per head per day.

Mineral supplements are costly and may range in price from about \$400 to \$1,000 dollars per ton depending upon the ingre-

dients and feed additives included. Obviously, any significant increases from the recommended daily intake may add substantial costs that will likely not benefit animal performance or health. Using the example above, while the average consumption was well within an expected range, the costs are increased by 10% or about 40 cents per head.

Producers are urged to follow the recommended guidelines to keep their costs in check while providing their animals with a mineral supplementation program.

1. Read the feeding instructions label on the 50 lb. bag and estimate the number of servings that are provided. For example, if the recommendations are 4 ounces per head per day (50 lb. bag x 16 ounces/lb. = 800 ounces / 4 ounces per day) this translates into 200 available servings.
2. For example, if there are 50 head of cattle in the pasture, this bag of complete mineral should last approximately 4 days. So, in this particular instance, one should plan to provide 2 bags of mineral per week.
3. Upon initial introduction to the pasture, place the mineral in the vicinity of a water source or where cattle tend to congregate. This will allow the group to find the mineral offering.
4. Allow for a few weeks to gauge where mineral intake is before determining if intake is satisfactory or if any actions are necessary to modify the intended intake.
5. If mineral consumption is excessive, consider moving the mineral location further away from the original site or away from the water source.
6. Cattle do not specifically choose which macro or trace mineral they are deficient in and do not adjust their consumption for this. Rather, the appetite for salt drives consumption of the complete mineral. With that said, consider providing a salt block adjacent to the complete mineral if consumption is excessive.
7. If mineral consumption is insufficient, ensure that the mineral is fresh and not contaminated with water or debris. Covered mineral feeders will insure mineral is not contaminated. However, it is important to insure the flaps are initially hard wired up to facilitate the training of the cattle to the presence of mineral.
8. If Monensin Sodium (Rumensin) is included in your mineral supplement, be mindful that expected consumption may be reduced by approximately 50%. To rectify this occurrence, the addition of flavor enhancers such as dried molasses may be used although this will increase cost.

**For more information on calf health programs, please visit or call the Cheyenne County Extension Office at (785)332-3171.**



# TIRED OF WINTER?

## LET'S START THINKING SPRING

### Wild flowers bring bursts of color to home landscapes

Wildflowers offer variety and color to a home landscape. In addition to eye appeal, they can survive in soils containing a wide range of chemistry pH and with varying numbers of sunny days, adding variety to garden areas.

To establish a wildflower area, Kansas State University horticulture expert Ward Upham recommends using a regional seed blend from Sharp Brothers, Stock Seed or Wildseed Farms.

“It is better to choose a blend of grasses and wildflowers rather than a single species,” Upham said.

When building a wildflower area, first remove existing vegetation to help wildflowers take root and grow.

Upham recommends:

- Control perennial weeds by using a product containing glyphosate.
- Use glyphosate the fall before planting to make soil preparation easier the following spring.
- Before planting, adjust pH and fertilize according to results of a soil test.
- The seedbed should be firm so that the boot heel sinks in no more than ½ inch. The goal is good seed/soil contact.
- Mix seed with damp sand (4:1 sand/seed) for more uniform coverage with a drop seeder or whirlybird spreader.
- Rake seed in about ¼ inch deep. It is best if the seedbed is firmed up by using a roller or driving over the area with a riding lawn mower. Don't mulch.
- Keep seed moist while the seed is germinating (3-4 times per week, if possible). Slowly back off watering as plants develop.

“Warm-season grasses and most prairie flowers should be seeded between April 1 and May 15,” Upham said.

“To control remaining living vegetation, spray with a product containing glyphosate, wait a week and plant.”

Keeping the soil at least 60 degrees Fahrenheit is also important before planting seeds. Soil thermometers are available in most garden centers, hardware stores and auto stores.

“Hand weeding can help but must be done with care to avoid uprooting small prairie flowers. Mow as high as possible to help control fast growing weeds while preserving most of the foliage on the prairie flower,” Upham said.

### Now is the time to plant strawberries

The current cool period is perfect for starting strawberry plants in Kansas, said Kansas State University horticulture instructor Cynthia Domenghini.

She said mother plants should be set from mid- to late March in southern Kansas and late March to mid-April in northern Kansas when soil temperatures are between 65-80 degrees Fahrenheit.

“Establishing mother plants in early spring encourages daughter plants to grow earlier as well,” Domenghini said. “This results in larger growth from the first daughter plants by the end of the growing season and ultimately more berries the following spring.”

Planting strawberries during higher temperatures stresses mother plants, limiting their growth and making them weaker, which negatively affects the number of berries produced.

“During the first growing season, removing all flowers prevents energy used for fruit development, Domenghini said. If fruit is allowed to develop during the first year of growth, expect weaker daughter plants and a drastic reduction in the amount of fruit the following year due to insufficient energy,”

Goodluck with your Spring Gardening!



## **\*\*NEW\*\* 4-H Foods & Nutrition Rule for 2023 Kansas State Fair**

For food safety purposes, any entries with frostings and fillings must calculate the amount of sugar in the frosting/filling recipe only. Calculation must be attached to entry, or the placing will be lowered one ribbon when judged. Frosting and fillings need to contain more than 65% sugar for safety. Examples on how to calculate this percentage are included in the publication located at <http://bookstore.ksre.ksu.edu/pubs/MF3544.pdf>

While the concept has been encouraged and taught in previous years, it has not been a required item or stated in the rules. It will be added to the 2023 4-H Kansas State Fairbook.

### **Ingredients or products still NOT allowed:**

- |   |  |
|---|--|
| -raw eggs in uncooked frostings or fillings           | -raw flour in uncooked frostings or fillings |
| -cream cheese frosting or filling                     | -chocolate ganache                           |
| -heavy cream frosting                                 | -lemon curd                                  |
| -fresh cut fruit or vegetables as garnishes           | -custard pie                                 |
| -cream pie  | -chiffon pie                                 |
| -fresh (unbaked) fruit pie (ex. fresh strawberry pie) | -any meat                                    |
| -friendship bread started, not refrigerated           |  |



## **2023 Discovery Days**

**Kansas 4-H Discovery Days is at the Kansas State University campus, June 7-9, 2023.**

- Help youth learn new ideas, techniques, and skills they can use personally and in their 4-H clubs or groups and communities
- Give youth in-depth training through hands-on educational sessions from content and youth development experts
- Prepare youth to make informed decisions about their careers and college path
- Enhance personal growth by giving opportunities to develop responsibility, confidence, independence, accountability, problem-solving, decision-making, and time-management skills
- Help youth meet new people and make new friends from different places and with different backgrounds from across the state
- Provide an opportunity for youth to experience the K-State campus and its wealth of resources
- Develop college and career readiness skills that prepare participants academically and socially for a successful transition to college and life as an adult

Registration Deadline: May 15, 2023



**Sherman County**  
Harrison Bhend  
Jason Colby  
Jarek Crow  
Strid Loudon  
Maverick Spresser

**Cheyenne County**  
Jesus Duran  
Molly Gilliland

**Wallace County**  
Desirae McQuillan  
Claire Helsel

**Summer Day Camps**

- Cinco de Mayo .....May 26
- Fishing Clinic.....June 1
- Babysitting Clinic .....June 6
- Project Learning Day ....June 24
- Farm to Fork .....June 29

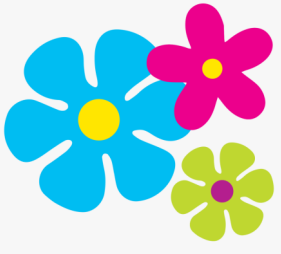
More info to come!

Watch for flyers to come to the schools and follow our Facebook Page.

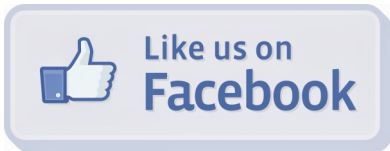


**New date for 2023!**

Horse IDs are due June 1, 2023



**2023 Wallace Co Fair Dates and Theme are:**  
**July 27-29**  
**“Footloose and Groovy at the County Fair”**



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<http://www.facebook.com/sunflowerwallace>  
<https://www.facebook.com/sunflowerextensiondistrictshermancounty4h/>



# Sunflower District 2023

| Sunday   | Monday   | Tuesday | Wednesday  | Thursday | Friday   | Saturday   |
|--|--|---------|--|----------|--|--|
|  | 1.<br><b>Beef Nominations Due</b><br><b>Add/Drop Projects Due</b><br>CN-Breeding Heifer & Market Livestock Ownership ID Due<br>WA- Small Animal weigh-in | 2.      | 3.<br><b>Foods</b><br>in Goodland<br>3:30 - 5:00 PM MT | 4.       | 5.   | 6.<br><b>Loyalty Day Spring Live-stock Show</b> —<br>Tribune               |
| 7.<br><b>Sharon Springs</b> — Graduation<br><br><b>Loyalty Day Spring Live-stock Show</b> —<br>Tribune | 8.   | 9.      | 10.  | 11.      | 12.  | 13.<br><b>Cheylin</b> —<br>Graduation<br><br><b>Weskan</b> —<br>Graduation |
| 14.<br><b>St Francis</b> —<br>Graduation   | 15.<br><b>Discovery Days registration closes</b>   | 16.     | 17.  | 18.      | 19.  | 20.<br><b>Goodland</b> —<br>Graduation                                     |
| 21.  | 22.  | 23.     | 24.  | 25.      | 26.<br><b>Cinco de Mayo Day Camp</b><br>4-H Building in Sherman Co | 27.  |
| 28.  | 29.<br><b>MEMORIAL DAY</b><br>Extension<br>Office is closed  | 30.     | 31.  |          |  |  |



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