



# Grassland Curing Guide

A guide on how grasses green-up and cure in the  
Midwest with Iowa centric photos

**Curing observations:** Submit each  
**Monday** and if possible **Thursday** morning  
via [wxcoder.org](http://wxcoder.org) or call 800-759-9276



## The Grassland Curing Guide

This booklet will assist you in estimating the level of cured grasses (primarily in ditches and natural areas) for the purpose of assessing and predicting fire danger and fire behavior. Visual estimation based upon the Grassland Curing Guide helps to assess grass fuel moisture.

Estimates of curing status aid the following in Iowa:

- Determination of the onset of fire season
- Estimation of fire danger
- Calculations of fire behavior and fire spread
- Anticipating / planning for deployment of fire fighting resources

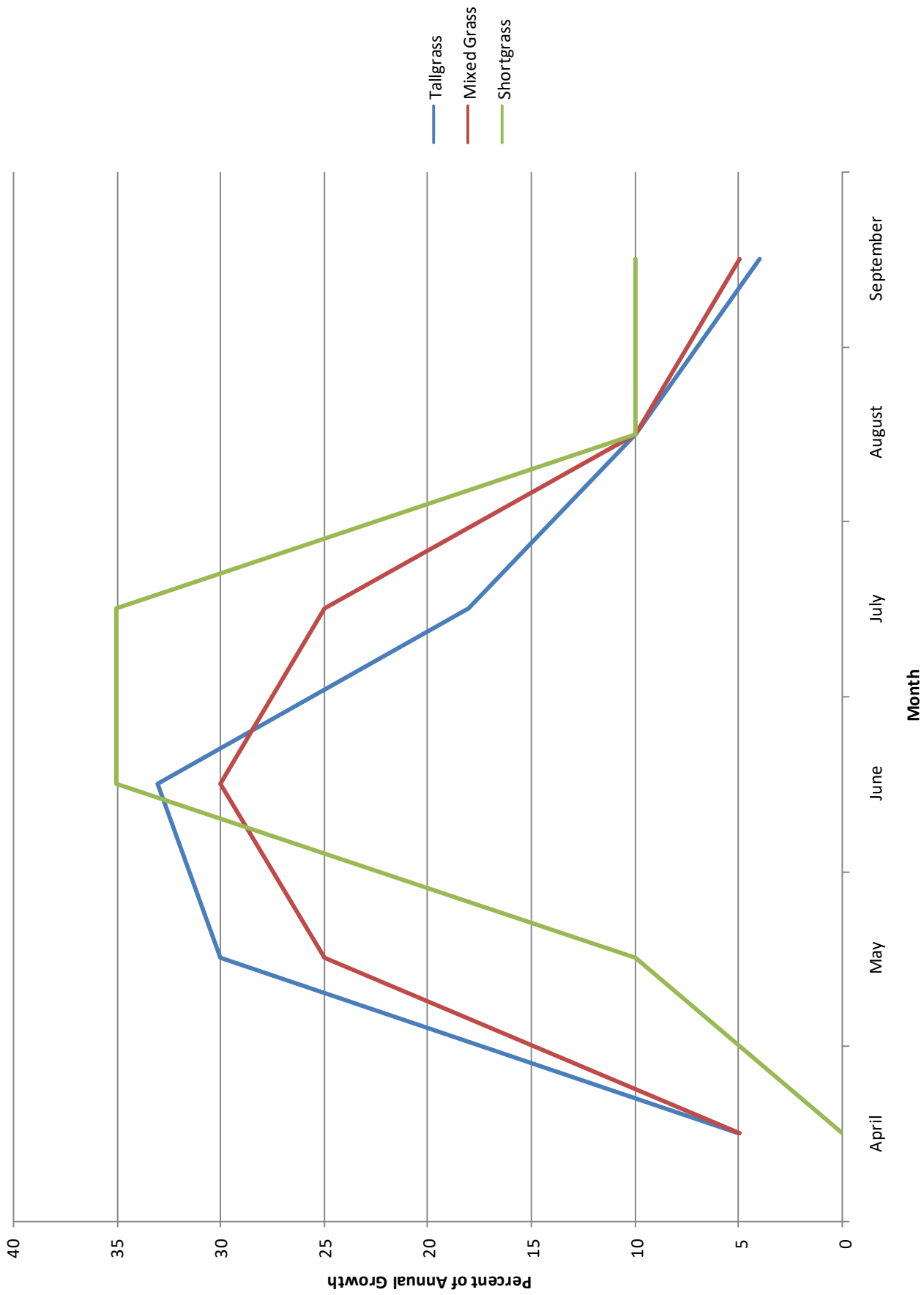
## The Green-up and Curing Processes

Most native, crop, and pasture species develop through a life cycle in which the plant annually greens up in the spring, matures during the summer, dries out in the late summer or fall, and then dies or becomes dormant. This annual drying process is termed curing, and this is how fuel is created, which generates the potential for grassland and/or agricultural fires.

During spring, above-ground plant material is cured from the prior growing season. As temperatures warm, roots are stimulated to begin a period of new growth known as green-up. Growth continues through the summer and is normally completed in the fall, depending on rainfall and temperatures. As plants reach maturity and the period of growth is completed, plants begin to lose their ability to draw moisture from the soil. Thus during the late summer and fall, plants lose much of their moisture and become cured, and this vegetation persists until green-up is well underway the following spring, completing the annual cycle.

A chart of the percentage of overall growth during the growing season in the central United States is shown in Figure 1 (next page). For example, the total growth of any plant during a growing season is 100%. Broken down by month, the greatest percentage of growth for tall-grass prairie usually occurs in June (33%), while the greatest growth for shortgrass occurs during June through July (35%). Growth slows markedly by late summer and comes to an end with the arrival of freezing temperatures.

# Vegetative Growth Curves



## How to use this Guide

The following photos are a guide only, and measurements made based on color alone are not adequate. Investigation of the physiological characteristics of the grass sward (the descriptions are located beside each photo) is also required.

- Ideally, you should study the ditches and natural areas at close quarters and at a number of different sites before determination of the state of curing. Viewing only from the roadside or fence-line may lead to inaccurate estimates.
- Determine the overall color and check for seed head development. Match these with the appropriate description in the guide and select the 'percentage cured' figure.
- Consider both cool season and warm season plants together. There is no need to separate the curing estimate by vegetation type.
- Ensure that the selected figure is appropriate to other native species within the area by observing a number of other locations.
- Do not worry about crop areas. Data for corn and soybeans (in the fall) are provided by the USDA.
- The 'percentage cured' may now be reported to the NWS. This information, along with the weather forecast, is used to estimate fire danger and behavior.

<b>% Cured</b>	<b>Color</b>	<b>Physiological Change</b>
<b>0</b>	Green	From the beginning of growth to commencement of seed head development
<b>10</b>	Green	Seed heads formed and flowering
<b>20</b>	Yellowish-Green	Seed heads maturing and seed dropping
<b>30</b>	Yellowish-Green	Most seed heads mature and seed dropping
<b>40</b>	Yellow-Green	Most seed heads mature and seed dropping
<b>50-60</b>	Straw—odd patch of green and greenish-yellow	Up to 1/2 of all stems have dropped their seed, some paddocks will be fully cured, others may be quite green
<b>70-80</b>	Straw—very little green showing anywhere	Most seed heads have dropped their seed, lower third of stalk may be green
<b>90</b>	Straw—odd green gully	Essentially all seed has dropped, odd individual stalk may be green
<b>100</b>	Bleached	All stalks fully cured, seed heads and stalks break easily



## Important Notes

- Hot and dry weather in mid to late summer will speed the curing process, while consistent summer rainfall will delay the curing process.
- Curing is more patchy with increasing species number and variable topography.
- Rainfall before 60% cured will prolong grass life and slow curing, while rainfall after 60% cured will not further delay the curing of mature grass.
- Above 80% cured, fuel moisture content begins to be significantly influenced by environmental factors such as humidity and temperature.
- The long-term rainfall and temperature patterns and the growth habits of the individual grass species also influence the progression of curing.

## When and How To Report Curing Values

<b>March - May:</b>	Report each <b><u>Monday and if possible Thursday morning</u></b>
<b>September - mid-November:</b>	(or any time you observe conditions have significantly changed)

During other periods of dryness such as extended drought, we may call and ask for reports.

**Submit your curing observation at:**

**[wxcoder.org](http://wxcoder.org) or call at 800-759-9276**

**Thank you for your participation in this process. Your observations are critical to helping us assess and forecast fire danger in support of fire safety officials in Iowa.**

## Curing Photos

On the following pages, photos of grasses at various stages of curing or seed development are shown first with warm season grasses followed by cool season grasses. Many of these photos were taken in Iowa. Next to each photo is listed the following:

- color of grasses
- type of grass,
- description of curing or seed development,
- location,
- date of the photo

**Many of the photos in this guide were provided by Alex Meyer, Franklin County Conservation, and Ben Hoskinson, Mahaska County Integrated Roadside Vegetation Management.**

Information for the original Grassland Curing Guide was provided by Mark Garvey (Country Fire Authority in Australia), Mary-Beth Schreck (NWS WFO Wichita, KS), Ray Wolf (NWS WFO Quad Cities), and Daryl Smith and David O'Shields (Tallgrass Prairie Center at the University of Northern Iowa) with photographs from Gary Cramer (Sedgwick County, Kansas Extension Office) and Janet Spurgeon (NWS WFO Wichita).

## 0-10% Cured - Warm Season Grasses



**Color:** Green

**Grass Type:**  
Indiangrass, Big  
Bluestem,  
Switchgrass

**Spring Green-Up:**  
There may be a  
little cured plant mate-  
rial from the prior sea-  
son, but growth is very  
active at this time. Mid  
to late spring.

**Location:** Mahaska  
County, IA

**Photo Date:** June  
2013



**Color:** Green-  
Yellow

**Grass Type:** Flow-  
ering Indian and Big  
Bluestem

**Seed Develop-  
ment:** From begin-  
ning of grass growth  
to commencement of  
seed head develop-  
ment and flowering

**Location:** Mahaska  
County, IA

**Photo Date:** Sep.  
5, 2013



## 10-20% Cured - Warm Season Grasses



**Color:** Yellowish-Green to Green

**Grass Type:**  
Indiangrass, Big Bluestem, Switchgrass

**Spring Green-Up:**  
Spring green-up not yet complete. Early to mid spring.

**Location:** Franklin County, IA

**Photo Date:** May 23, 2022



**Color:** Green-Yellow

**Grass Type:**  
Switchgrass

**Seed Development:** 10%: Seed heads formed and flowering. 20%: Seed heads maturing and opening from top. Late spring to early summer.

**Location:** Mahaska County, IA

**Photo Date:** Sep. 19, 2022



## 30-40% Cured - Warm Season Grasses



**Color:** Yellow-Green

**Grass Type:**  
Indiangrass, Big Bluestem, Switchgrass

**Spring Green-Up:**  
Spring green-up not yet complete. Early to mid spring.

**Location:** Franklin County, IA

**Photo Date:** May 16, 2022



**Color:** Yellow-Green

**Grass Type:**  
Switchgrass

**Seed Development:** Most seed heads mature and seed dropping. Late summer to early fall.

**Location:** Mahaska County, IA

**Photo Date:** Oct. 14, 2022



## 50-60% Cured - Warm Season Grasses

In need of a photo.

If you have a photo that could fill this space, email to [dmx.fire@noaa.gov](mailto:dmx.fire@noaa.gov)

Credit will be given on page 6.

**Color:**

**Grass Type:**

**Spring Green-Up:**

**Location:**

**Photo Date:**

**Color:** Yellow-Green

**Grass Type:** Indiangrass and Big Bluestem

**Seed Development:** Approximately 1/2 of all stems have dropped their seed. Note: Some fields will be fully cured, others may be fairly green. Fall.

**Location:** Mahaska County, IA

**Photo Date:** Oct. 25, 2013





## 70-80% Cured - Warm Season Grasses



**Color:** Straw, very little green showing, some greenness evident in lower third of stalks. Many stalks fully cured.

**Grass Type:**  
Indiangrass, Big Bluestem, Switchgrass

**Spring Green-Up:**  
Becoming apparent due to cool season species. Early spring.

**Location:** Franklin County, IA

**Photo Date:** May 2, 2022



**Color:** Yellow-straw, little green showing

**Grass Type:**  
Switchgrass

**Seed Development:** Most seed heads have dropped their seed

**Location:** Mahaska County, IA

**Photo Date:** Oct. 24, 2022



## 90-100% Cured - Warm Season Grasses



**Color:** Bleached

**Grass Type:**

Indiangrass, Big  
Bluestem, Little  
Bluestem, Canada  
Wild Rye, Virginia  
Wild Rye (mainly  
warm season except  
Canada Wild Rye)

**Spring Green-Up:**

Not started/winter

**Location:** Mahaska  
County, IA

**Photo Date:** April  
11, 2022



**Color:** Straw to  
bleached

**Grass Type:**  
Switchgrass

**Seed Develop-  
ment:**

Essentially all seed  
has dropped, odd indi-  
vidual stalk may be  
green, otherwise fully  
cured. Late fall to win-  
ter.

**Location:** Mahaska  
County, IA

**Photo Date:** Nov.  
15, 2022



## 0-10% Cured - Cool Season Grasses



**Color:** Green

**Grass Type:**

Mainly Smooth Brome, some Reed Canary Grass

**Spring Green-Up:**

There may be a little cured plant material from the prior season, but growth is very active at this time. Mid to late spring.

**Location:** Franklin County, IA

**Photo Date:** May 23, 2022



**Color:** Green

**Grass Type:** Reed Canary Grass

**Spring Green-Up:**

There may be a little cured plant material from the prior season, but growth is very active at this time. Mid to late spring.

**Location:** Mahaska County, IA

**Photo Date:** Unknown



## 10-20% Cured - Cool Season Grasses



**Color:** Yellowish-Green to Green

**Grass Type:**  
Mainly Smooth  
Brome, some Reed  
Canary Grass

**Spring Green-Up:**  
Spring green-up not  
yet complete. Early to  
mid spring.

**Location:** Franklin  
County, IA

**Photo Date:** May  
16, 2022



**Color:** Green-  
Yellow

**Grass Type:**  
Smooth Brome

**Seed Develop-  
ment:** Most seed  
heads mature and  
seed dropping. Late  
summer to early fall.

**Location:** Mahaska  
County, IA

**Photo Date:** Sep.  
22, 2022



## 30-40% Cured - Cool Season Grasses



**Color:** Yellow-Green

**Grass Type:**

Dead standing grass is native, exact species unknown

**Spring Green-up:**

Spring green-up not yet complete. Early to mid spring.

**Location:** Unknown

**Photo Date:** Unknown



**Color:** Yellow-Green

**Grass Type:** May be Smooth Brome

**Seed Development:** Unknown

**Location:** Unknown

**Photo Date:** Unknown



## 50-60% Cured - Cool Season Grasses



**Color:** Straw—Odd patch of green or yellowish-green

**Grass Type:**  
Mainly Smooth Brome, Reed Canary Grass

**Spring Green-Up:**  
Green-up apparent due to cool season species. Early spring.

**Location:** Franklin County, IA

**Photo Date:** May 9, 2022



**Color:** Straw—Odd patch of green or yellowish-green

**Grass Type:** Mainly Smooth Brome

**Seed Development:** Approximately 1/2 of all stems have dropped their seed. Note: Some fields will be fully cured, others may be fairly green. Fall

**Location:** Unknown

**Photo Date:** Unknown

## **70-80% Cured - Cool Season Grasses**

**In need of a photo.**

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**Credit will be given on page 6.**

**Color:**

**Grass Type:**

**Spring Green-Up:**

**Location:**

**Photo Date:**

**In need of a photo.**

**If you have a photo that could fill this space, email to [dmx.fire@noaa.gov](mailto:dmx.fire@noaa.gov)**

**Credit will be given on page 6.**

**Color:**

**Grass Type:**

**Seed Development:**

**Location:**

**Photo Date:**



## 90-100% Cured - Cool Season Grasses



**Color:** Bleached

**Grass Type:**

Mainly Smooth  
Brome, Reed Canary  
Grass

**Spring Green-Up:**

Not started/winter

**Location:** Franklin  
County, IA

**Photo Date:** April  
27, 2022



**Color:** Bleached

**Grass Type:** Mainly  
Smooth Brome

**Seed Develop-**

**ment:** Essentially all  
seed has dropped,  
odd individual stalk  
may be green. Late  
fall to winter.

**Location:** Unknown

**Photo Date:** Un-  
known