

# Utilizing Drought Stressed Soybeans for Forage

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Although soybeans are most commonly grown as a grain crop, they can be grazed or harvested as either a hay or silage crop. This most commonly occurs when the grain potential of the soybean crop has been reduced by drought, hail damage, or early frost. A realistic forage yield expectation for drought stressed soybeans would be 1.5 to 2.0 tons of dry matter per acre. The objective of this article is to provide practical tips for successfully, grazing, conserving and feeding drought stressed soybeans.

## Considerations Before Utilizing for Forage

Before grazing or harvesting drought stressed soybeans for forage there a number of important considerations that should be taken into account.

*Consult crop insurance agent.* Consult your crop insurance agent prior to taking any action including grazing, harvesting as forage, destroying the crop, or replanting. Failure to do so may result in the loss of indemnity payments.

*Consult with USDA Farm Service Agency.* Consult with your local Farm Service Agency representative to make sure that any actions that you take including harvesting drought stressed soybeans as forage will not preclude you from receiving disaster relief payments or participating in subsequent farm programs.

*Consider the value of the grain.* Although the value of the grain that could be harvested is hard to determine, it should always be considered prior grazing or harvesting as conserved forage. In some years, the price of soybeans may be high enough to justify the harvest of fields with lower yields.

*Consider harvest restrictions for herbicides used.* Many herbicides labeled for soybean use do NOT allow for grazing or harvest as hay or silage. Always consult herbicide labels prior to grazing or harvesting as hay or silage. A list of grazing and harvest restrictions for commonly used herbicides can be found in Table 1. The most commonly used herbicide program, Roundup Ready® Xtend Crop System, does allow for forage harvest.

*Harvest or graze before leaves yellow and fall off.* Drought stressed soybeans will contain very little grain. So it is essential to harvest or graze soybeans when the leaves are still green. If harvested prior to leaf loss, drought stressed soybeans with no bean development can have 12-15% crude protein and 55-60% total digestible nutrients.

*Baling soybean residue is NOT recommended.* In most cases, soybean residue is poor in nutritional value. Typical composition of soybean residue is 4% crude protein and 35-40% TDN and palatability tends to be low. Corn stalks typically yield more and have a higher nutritional value.

## **Grazing Drought Stressed Soybeans**

If fields are fenced, grazing may be the simplest way to utilize drought stressed soybeans. Unfortunately, most crop fields are no longer fenced. It is possible to quickly erect temporary electric fences, but they are generally NOT recommended as perimeter/containment fences. If electric fencing is used, it is imperative that animals are trained to it prior to grazing.

*Allow animals to adapt to soybeans.* Since cattle are not used to grazing soybeans, it may take a few days for them to adapt. Once adapted, animal performance should be good.

*Grazing soybeans may cause bloat.* The chance of bloat from grazing soybeans exists, but is lower than that of clover or alfalfa. To mitigate the chances of bloat, never turn hungry animals into soybeans, do not graze wet soybeans, provide access to a palatable grass hay or silage, and use feed additives designed to reduce the chances of bloat such as surfactants and ionophores. More information on bloat is available in the following publication [ID-186, Managing Legume-Induced Bloat in Cattle](#).

*Strip graze soybeans.* Strip grazing soybeans will increase utilization and reduce trampling losses. In addition, it reduces selective grazing of just pods and leaves. Since soybeans will not regrow after grazing, no back fence is needed. Simply start at your water source and set up a temporary electric fence that provides only enough forage for 2-3 days of grazing. The smaller the strip provided, the more efficient the utilization (less will be trampled). Some producers may choose to move the fence every day. Make sure and set up a second fence before taking the first fence down.

## **Harvesting Drought Stressed Soybeans as Baleage**

If grazing is not possible then the next best option is to harvest drought stressed soybeans as chopped silage or as baleage. Harvesting soybeans as silage/baleage reduces leaf shatter and results in a higher quality conserved forage. The following tips will help to optimize harvest as baleage or silage.

*Mow early in the day.* Mowing early in the day, after dew has dried off, maximizes wilting time. Rapid wilting and ensiling will result in higher nutritive value and lower dry matter losses.

*Use mower-conditioner.* Always use a mower-conditioner to crush stems. More roller pressure than normal will be needed to crush the larger diameter stems of soybeans.

*Adjust mower-conditioner to leave the widest possible swath.* Make mower swaths as wide as possible to maximize surface area exposed to solar irradiation. This will shorten wilting time and result in more uniform drying.

*Wilt to 55 to 65% moisture.* Wilting to the proper moisture range ensures rapid and complete fermentation.

*Make dense bales.* A slower ground speed during baling allows for the formation of dense bales that ensile well. Since bales will be considerably heavier than dry hay, make bales small enough that they can be safely handled with your equipment.

*Use plastic twine or net wrap.* Do NOT use treated sisal twine. The treatment reacts with the UV inhibitors in the plastic causing it to breakdown.

*Wrap bales immediately after baling.* Delaying wrapping allows undesirable microbial growth and delays the start of fermentation. Rapidly excluding oxygen from the forage is essential for fast and complete fermentation.

*Use at least 6 layers of high quality silage wrap.* A minimum of 6 layers of a high quality UV stabilized wrap designed for bale silage should be used. This is NOT the place to save money. Not applying enough layers, or using poor quality wrap will result in poor fermentation, lower nutritive value, and higher dry matter losses.

*Wrap at storage site.* If possible, wrap bales where they will be stored. This minimizes handling and the chances of damaging the silage film.

*Immediately patch holes in plastic.* It is very important to check bales regularly for damage, even small holes can compromise entire bales. Use a UV stabilized tape designed for silage wrap to patch holes.

*Allow bales to ferment 6 to 8 weeks prior to feeding.* In cases where the silage is needed more quickly, bales can be fed after 4 weeks of fermentation.

*Silage inoculants may improve fermentation.* Silage inoculants are generally not needed with soybean baleage or silage. However, they can improve fermentation if ensiling conditions are less than ideal.

### **Harvesting Drought Stressed Soybeans as Dry Hay**

If it is not possible to harvest drought stressed soybeans as baleage, they can be harvested as dry hay. However, leaf shatter during raking and baling can be high. The following tips will help to minimize leaf loss and maintain nutritive value when soybeans are conserved as dry hay.

*Mow early in the day.* Mowing early in the day, just after dew has dried off, maximizes first day drying time. This shortens the curing period, reducing dry matter losses to respiration.

*Use mower-conditioner.* Always use a mower-conditioner to crush stems. More roller pressure than normal will be needed to crush the larger diameter stems of soybeans.

*Adjust mower-condition to leave the widest possible swath.* Make mower swaths as wide as possible to maximize surface area exposed to solar irradiation. This will shorten curing time and result in more uniform drying.

*Do not rake when leaves are dry.* Raking soybean hay that is below 40% moisture will result in high levels of leaf loss. This reduces the nutritive value and palatability of the hay, and ultimately dry matter intake by livestock.

*Do NOT ted soybean hay.* Tedding soybean hay will result in high levels of leaf loss. It is better to gently turn windrows over with a side delivery rake.

*Bale at 16-18% moisture.* Baling hay above 18% moisture will result in mold growth, heating of hay, and reduction in nutritive value. Excessive heating can also result in hay fires.

*If hay becomes too dry, wait to bale.* Soybean hay that becomes excessively dry can experience very high levels of leaf loss during baling. Leaf loss can be minimized by baling in late morning after the dew has dried off, or late evening after higher humidity levels have made leaves more pliable.

*Store hay undercover.* If at all possible, store soybean hay in a shed or covered with a well secured heavy duty tarp to prevent dry matter and nutritive value losses. Like other legumes, soybean hay tends to be more susceptible to weathering than grass hay. The stems and leaves of soybeans do not shed water as readily as grass hay.

### **Feeding Considerations for Soybean Forage**

*Make sure livestock have unrestricted access to clean and fresh water.* Water is the single most important nutrient in livestock production and the nutrient required in the largest quantities.

*Make sure that livestock have access to free choice mineral.* Livestock require macro- and micro-nutrients to support growth, maintenance, and lactation. Make sure livestock have access to a free choice mineral supplement that meets [UK Beef IRM Mineral Supplement Requirements](#).

*Test forage prior to feeding.* In general, soybean hay and silage is relatively high in forage quality. However, excessive leaf loss during harvesting, heating, or poor fermentation can significantly alter the nutritional value. Therefore, it is recommended to obtain a forage test and supplement as needed.

*Feed soybean hay or baleage in a ring feeder.* Placing bales in a ring feeder will help to reduce waste.

*Only put out enough baleage for a maximum of 2 to 3 days.* When the plastic wrap is removed from baleage, oxygen starts to degrade the fermented forage. By putting out smaller quantities more frequently, aerobic deterioration is limited.

*If high in grain, limit soybean forage to one-half of dry matter intake.* While not normally a problem with drought stressed soybeans, high amounts of mature soybean seeds in the forage can result in excessive amounts of fat. This can negatively impact fiber digestion and limit dry matter intake.

*Soybean forage may cause bloat.* The risk of bloat when feeding soybean hay is very low. If this risk is a concern, it can be mitigated by allowing access to a palatable grass hay or silage along with the soybean hay or pasture.

*For more information on utilizing soybeans for forage, contact your local extension agent or visit the [UK Forages Webpage](#).*

Table 1. Waiting Period or limitations before utilizing herbicide treated soybeans for harvested grain or forage feed<sup>1</sup> (*Adapted from AGR-6, 2019 Weed Control Recommendations for Kentucky Grain Crops, UK Cooperative Extension Service*).

<b>Herbicide</b>	<b>Harvested Grain</b>	<b>Forage (silage, hay, etc.)</b>
Anthem Maxx	60 days	Do not feed
Assure II	80 days; Do not apply after pod set	Do not feed
Authority Elite & BroadAxe HC	---	30 days
Authority First / Sonic	65 days	Do not feed
Authority MTZ	---	Do not feed
Authority Assist	---	Do not feed
Authority XL	---	Do not feed
Boundary	----	40 days
Butyrac 200	60 days	60 days
Canopy/Canopy Blend	---	Do not feed
Canopy EX	---	14 days
Cheetah Max	70	Do not feed
Classic	60 days before maturity	Do not feed
Cobra / Phoenix	45 days (Do not apply later than R6 stage)	Do not feed
2,4-D	---	Do not feed
Dual II Magnum & Cinch	--- 90 days for post	None for soil applied Do not for post applied
Extreme	85 days (Apply before bloom)	Do not feed
Envive	---	Do not feed
Express TotalSol	---	Do not feed
Fierce / Fierce XLT	---	Do not feed
FirstRate ≤ 0.3 oz/A > 0.3 oz/A	65 days 70 days	14 days 25 days
Flexstar / Flexstar GT	45 days	Do not feed
Fusion	Apply before bloom	Do not feed
Fusilade DX	60 days	60 days
Glyphosate	Consult product label	Consult product label
Gramoxone Inteon or Firestorm or Parazone (At planting) (Post Directed) (Harvest Aid)	— — 15 days	Early pod stage Do not feed Do not feed
HarmonyExtra/FirstShot	---	Do not feed
Harmony SG	60 days	Do not feed
Intimidator	90 days	Do not feed
LeadOff	30 days	30 days
Liberty	70 days	Do not feed
Matador	---	Do not feed

Metribuzin (Soil-Applied) (Post-Directed)	— 70 days	40 days* 70 days (dry vines) Do not feed (green vines)
Outlook	---	Do not feed
Poast or Poast Plus	75 days	Soybean hay may be fed Do not graze or feed silage
Prowl	85 days	None*
Prefix Pre Prefix Post	— 90 days	Do not feed Do not feed
Pursuit	85 days (Apply before bloom)	Do not feed
Python / Accolade	85 days	Do not feed
Raptor	(Apply before bloom)	None*
Resource	60 days	Do not feed
Scepter	90 days	Do not feed
Select MAX, Select, & similar products.	60 days	Do not feed
Sequence (Preplant or Pre) (Post)	--- 90 days	30 days Do not feed
Sharpen	---	65 days
Surveil	---	Do not feed
Synchrony XP	60 days before maturity	Do not feed
Trivence	---	Do not feed
Ultra Blazer	50 days	Do not feed
Valor EZ or Valor SX	----	Do not feed
Valor XLT	----	Do not feed
Verdict	----	Do not feed
Warrant Ultra	45 days	Do not feed after post
Zidua	---	---
Zidua PRO	85 days	Do not feed

\*Use as a forage crop may be prohibited when applied in a tank mixture or sequential treatment with other herbicides

---- No restrictions indicated on herbicide label

1 This table should be used as guide for herbicide treated soybean when harvested for grain or as a forage crop.

Time intervals and limitations are based on the herbicide when used alone.

When more than one herbicide has been applied, the most restrictive product should be followed.

However, some labeled tank mixtures have more restrictive guidelines.

Always refer to the herbicide label(s) for specific information.



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