



# Species Annual and Alternative Soybean for Forage Illinois

## General Information

This fact sheet will discuss both grain soybean and the forage soybean cultivars used as a forage crop. Grain soybean has been utilized as an “emergency” or alternative forage crop when traditional forages are in short supply.

Three forage soybean cultivars (Derry, Donegal, and Tyrone) were released by the USDA-ARS in 1997 and were developed for forage and not for grain production.

## Adaptability

If growing a grain soybean variety for forage, it should have an indeterminate growth habit (vegetative growth continues beyond flowering) and be of a Maturity Group (MG) adapted for the area. Wisconsin research has shown that with grain soybean the greatest forage yield (3 - 3.5 tons dry matter per acre) and highest quality (19% crude protein) is obtained at R6 (full seed or ‘green bean’ stage) to R7 (beginning maturity) when the pod proportion of total forage is high.

Of the USDA-ARS forage soybean, Derry (MG VI) is adapted to the northern Midwest, Donegal (MG V) adapted to the Northeast, and Tyrone (MG VII) is adapted to the Southern States.

## Characteristics

Forage soybean has the same appearance as grain soybean but demonstrates a big growth increase in August. Forage soybean has an upright-growing habit and may reach heights of 6 feet or more. Derry has good lodging resistance, Donegal is prone to lodging, and Tyrone has moderate resistance to lodging. Both grain and forage soybeans do not regrow following harvest.

## Establishment

With timely planting, soybean harvested as forage should be planted in row widths of 20 inches or less and plant population should be comparable to that recommended for grain production (160,000 to 170,000 seeds per acre).

Minnesota research found that soybean planted in 10 inch rows yielded 4.6 tons dry matter per acre while soybean in 30 inch rows yielded 4.2 tons dry matter per acre. However, row width did not affect forage quality. Wisconsin data indicated 0.5 ton dry matter per acre increase when row widths were reduced from 30 inches to 8 inches.

## Management

The optimal stage to harvest forage soybean has not been conclusively determined. As a guide, consider harvest at the R3 stage or when pods are forming at the upper nodes on the main stem.

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## Management (Continued)

Iowa State University research found that by 135 days after planting, forage cultivars yielded 5 - 19% more dry matter than the top forage yielding grain cultivar. Forage cultivars were 37 - 69% taller than the tallest grain cultivar. Research at Ames, found that the Derry forage cultivar harvested 116 days after planting had 15% crude protein. In summary, the research showed that forage cultivars produced more dry matter yield than grain cultivars, but had lower leaf to stem ratio and lower leaf + pod to stem ratio in August and September, respectively, which may decrease the forage quality.

Research from Minnesota found the forage cultivars reached an average maturity of R3 (beginning pod stage) when the grain cultivars had reached R6 and R7. The forage cultivars produced little or no grain.

USDA research in Wisconsin found that two of the new forage cultivars appear to ensile better than a grain soybean cultivar. With all three cultivars, ensiling is improved if harvest is delayed until at least late August (50% pod fill in the grain cultivar). As a guide, forage soybean harvested for silage should be cut at the green pod stage and prior to the foliage turning yellow.

Be aware of the feeding/grazing restrictions on the labels of pesticides that have been used. Very few herbicides and insecticides are cleared for use in soybean that will be harvested as forage (i.e. hay, silage, and grazing).

Some work has shown promise for a mixed planting of forage soybean with grain sorghum or sorghum-sudangrass. Ohio data has suggested a 2 to 1 ratio (dry matter basis) of grass crop to grain soybean forage is optimum for improved fermentation and palatability.

## Summary

Forage soybean provides an optional crop for silage and grazing, but to reduce selective grazing it may be best to utilize the crop as silage. Many of the specific production and management guidelines for forage soybean are not yet established. Improvements in forage soybean will occur as additional research is conducted.

## Where to Get Help

For more information about soybean for forage, contact the local office of the Natural Resources Conservation Service (NRCS) or University of Illinois Extension.

## Acknowledgements

Information in this fact sheet was adapted from a number of sources, including the USDA, Agronomy Journal, Volume 93, Numbers 1 and 5; and Crop Sciences, Volume 38.