

Crabgrass for Forage

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Even though it has a reputation as a lawn weed, crabgrass is a high-quality, very palatable grass that is excellent forage for grazing livestock. It is a summer annual grass that germinates in spring, grows through summer and dies at frost in fall. Daily weight gains or milk production of livestock grazing crabgrass can easily exceed that from bermudagrass. It is very productive under good management. Crabgrass works well to provide summer forage when grown in mixtures with cool-season grasses such as tall fescue or with small grains used for forage.

Description

Several species of crabgrass exist, but the most common one grown for forage is large or hairy crabgrass (*Digitaria sanguinalis*). Crabgrass has a clump-type growth habit and spreads by long stolons or runners that form roots at nodes. It can grow to 2 feet tall. It is adapted to a wide range of environments and grows best on well-drained soils. It tolerates drought, but it should be planted on sites that are not excessively droughty during summer for best production. Once established, enough seed is usually produced each year to ensure volunteer stands the next year. Only two named varieties of crabgrass are currently available, those being 'Red River' crabgrass

and 'Quick-N-Big®' crabgrass. These varieties were selected for forage production and have a reliable, high-yielding growth type. Common crabgrass is also available. Crabgrass has a wide range of growth types, so a particular lot of common crabgrass seed may or may not have the desired growth characteristics for forage production.

Establishment

Crabgrass germination begins when soil temperature is around 58°F, so planting can usually begin by mid-April. Planting after mid-June is risky due to the lack of dependability of late summer rainfall. Seeding rate should be a minimum of 2 pounds of pure live seed (PLS) per acre, but planting 3 to 5 pounds PLS per acre helps ensure better stands. Two-year-old seed has been noted to have a higher establishment rate than one-year-old seed.



FIGURE 1. Vegetative crabgrass forage is very high quality and palatable for grazing.

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The period from seedling emergence to “first grazing” is normally 40 days under good conditions.

Crabgrass should be planted into a firm, well-prepared seedbed. The field should be thoroughly disked and rolled or cultipacked to make a smooth, firm seedbed. The seedbed should be firm enough at planting that when walking on it a shoeprint is no deeper than 1/2 inch. Seed can be broadcast on the prepared seedbed then covered by a second pass with a roller, or it can be planted with a drill about 1/4 inch deep. Planting too deep is a bigger concern than planting too shallow. Most seedlings emerge from within the top 1/2 inch of soil; very few emerge from more than 3/4 inch deep. If adequate moisture is present, some crabgrass seed will germinate within a few days, though the new stand may continue to thicken over a period of two months.

Since crabgrass is commonly grown with small grains, it can also be overseeded during winter into fall-planted small grain pasture. Crabgrass seed can be mixed with the spring fertilizer application for the small grain and overseeded in February to early March. Use grazing animals to tread the seed into the soil. Care should be used after overseeding to not “mud up” the field by grazing when the soil is wet. That could cause the crabgrass seed to be treaded too deep into the soil and reduce establishment. This method can also be used to establish crabgrass in a thin stand of fescue. The higher recommended seeding rate should be used when making dormant seedings.

Crabgrass seed does not flow well through planting equipment due to its light weight and rough-textured husk. Planting is often done by mixing the seed with a carrier such as fertilizer, dry sand or pelletized lime to provide bulk and improve flow characteristics. Prolonged contact of seed with fertilizer can damage germination, so seed mixed with fertilizer should be planted promptly. Crabgrass seed planted with a broadcast seeder will not spread as far as the fertilizer or pellet lime carrier, so adjust the spreader calibration for driving almost track-to-track in narrow swaths across the field. Some seed spreaders and seed drills have a special agitator in the bottom of the hopper that can maintain proper seed flow without the need for a carrier.

Managing as a Complementary Reseeding Annual

Although crabgrass is an annual grass, it can be managed for reseeding to produce volunteer stands indefinitely. Crabgrass should be managed to produce seed sometime between June and frost in fall to

ensure a volunteer stand the next year. It is very compatible when grown with small grains such as wheat or cereal rye. The small grain provides forage from late fall into spring, and the volunteer crabgrass fills in to provide forage through summer to early fall. It can also be managed to fill in voids of summer production in thin tall fescue pastures. Harrowing or light tillage improves seed germination and promotes better volunteer stands. Once a good stand of crabgrass has been obtained and managed for reseeding in a given year, shallow tillage in fall prior to planting winter annuals will incorporate crabgrass seed and usually results in an “automatic” crabgrass stand the next spring, even if no spring tillage is done. If no tillage is done in the fall, then light disking or harrowing to encourage volunteer crabgrass may be most appropriate in early May, either near the time of graze-out or hay harvest of the small grain forage or after close grazing or early May hay harvest of the fescue. If crabgrass is grown alone in a pasture, lightly disking or moderate harrowing during February to early March will stimulate volunteer seed germination and will encourage early stand establishment. Mixtures with annual ryegrass are not preferred and are more difficult to manage than mixtures with small grains. Ryegrass is very aggressive in spring and makes a thick top growth that can last through May and will smother crabgrass seedlings and reduce the stand.



FIGURE 2. Good emergence of volunteer crabgrass seedlings.

Fertilization

Crabgrass grows well under a wide range of soil pH levels from 5.5 to 7.5. It responds well to N fertilizer, but it can accumulate high nitrate levels under high N fertilizer or manure applications. Fertilizer N should be applied in split applications of 50 to 60 pounds per acre, with the first application

made when the seedlings have emerged and are in the early tiller stage. A second N application can be made after first grazing or hay harvest if additional forage is needed. Nitrogen applications should not be made after mid-August, since little growth response would be expected. Use the U of A soil test crop code 141, “Summer Annual Forages,” for additional fertilizer and lime recommendations.

Grazing

During the growing season, crabgrass is very palatable and is often grazed first by animals turned into a new pasture. Grazing can begin when crabgrass is 4 to 6 inches tall. Plants should not be grazed closer than 3 inches above the soil surface to allow opportunity for maximum regrowth. Crabgrass responds well to rotational grazing. If rotationally stocked, it is best to begin grazing when pastures are no more than 12 inches tall. Rotate the animals off when the forage is between 3 and 6 inches tall to allow regrowth. Continuously grazing plants to a short height leaves little leaf area for regrowth and greatly reduces yield potential. Crabgrass becomes very unpalatable after a killing frost and is usually avoided by grazing animals. Therefore, if a seed crop is produced during the summer, the crabgrass forage can be completely grazed out in late summer to optimize use of the forage before fall frost. This management approach allows other pastures to accumulate growth that can be grazed later in fall to reduce hay feeding.

Hay

Crabgrass is very productive. Yields of ‘Red River’ crabgrass in a five-year Arkansas forage trial averaged 4.4 tons per acre. Yield can be erratic, depending on summer rainfall, and can range from 1 to 2 tons per

acre to over 5 tons per acre. Crabgrass should be cut for hay in the boot to heading stage (normally 18 to 24 inches), which should allow at least two harvests per year. To favor quick regrowth, cutting height should be at least 3 inches to leave some green leaf tissue. Crabgrass regrowth is supported by remaining leaves and not by stored root and crown reserves like bermudagrass or fescue. Mowing the sward too short removes the leaf area and greatly slows regrowth. If crabgrass is cut before it makes mature seed, leave 6-inch uncut strips between mower swaths to produce enough seed for reseeding. Allowing crabgrass to make mature seed before being cut for hay results in low-quality hay. Crabgrass hay normally dries more slowly in the windrow than bermudagrass, and crabgrass hay is often dark in color, even though forage quality is not affected. Use of a mower/conditioner and tedder will help speed up hay drying rate.

Research at the University of Arkansas Southwest Research and Extension Center near Hope (Table 1) indicates that dry matter yields are increased by 155 percent when cutting interval is extended from 21 days (stem elongation) to 35 days (early heading). Dry matter yields were shown to be increased further to over 8,500 pounds per acre when crabgrass hay was harvested following 49 days of regrowth (late heading stage of maturity). Even though calculated TDN content of these forages decreased with longer harvest interval, there was no effect of harvest interval on growth performance of steers fed diets containing these forages.

Forage Quality and Digestibility

Crabgrass contamination of bermudagrass hayfields intended for horse hay is a concern because the slower drying rate of crabgrass forage increases chance for mold or spontaneous heating if the forage

TABLE 1. Effect of harvest interval^a of crabgrass hay on DM yield, growth stage at harvest and nutritive characteristics (Beck et al., 2007. *J. Anim. Sci.* 85:527-535).

Item	Harvest Interval		
	21 Days	35 Days	49 Days
Yield, lb DM/acre	2,527	6,454	8,613
Growth Stage	Stem elongation	Early heading	Late heading
CP, % DM	15.6	14.3	11.0
NDF, % DM	61.3	66.6	69.8
ADF, % DM	35.7	38.9	42.7
TDN, % DM	62.6	59.1	54.8

^aHays were harvested following 21, 35 or 49 days of regrowth.

TABLE 2. Concentrations of crude protein (CP), neutral detergent and acid detergent fiber (NDF and ADF) and total digestible nutrients (TDN) for whole-plant crabgrass forage in Northwest Arkansas sampled weekly on seven dates and for alfalfa, common bermudagrass and orchard-grass control hays that were evaluated simultaneously *in situ* (Ogden et al., *J. Anim. Sci.* 2005. 83:1142-1152)

Sampling Date	Growth Stage	CP	NDF	ADF	TDN
July 11	Stem elongation three nodes	21	55.5	29.4	62.4
July 18	Flag leaf emerging	19.2	55.6	27.5	63.9
July 25	Flag leaf sheath swollen	17.1	57.4	28.8	62.3
August 1	< 50% Inflorescence emerged	19.1	60.8	31.2	60.4
August 8	< 50% Inflorescence emerged	17.8	58.8	28.9	62.4
August 15	Milk stage	16.8	61.9	31.3	59.9
August 22	Milk stage	15.9	61.2	30.9	60.1
Control Hays for Comparison					
	Alfalfa	16.2	51.9	38.7	56.1
	Bermudagrass	17.1	62.1	27	64.1
	Orchardgrass	12.3	67.2	34.9	58.1

is not well dried before baling. The darker color of crabgrass hay has less eye appeal than the green color of well-cured bermudagrass hay. However, even with its unfounded reputation as a weed, the forage quality of crabgrass is typically better than that of most other summer grasses, such as bermudagrass, bahiagrass, pearl millet or sorghum-sudan hybrids. Research conducted in northern Arkansas showed that common crabgrass quality remained high even as plants reached maturity (Table 2). Crude protein (CP) declined in a narrow range from 21 percent in the vegetative stage in July to 15.9 percent at the milk stage in late August. Neutral detergent fiber (NDF) content and acid detergent fiber (ADF) content showed relatively little change over the same time span. Most forages continue to accumulate fiber with advancing maturity, which also causes lower forage intake and digestibility. By comparison, some other common warm-season forages were noted to contain much higher NDF levels: bermudagrass – 64 to 82 percent, bahiagrass – 70 to 78 percent and dallisgrass – 68 to 71 percent. Due to the lower fiber content, crabgrass forage was broken down in the rumen 44 percent faster than high-quality bermudagrass hay. The lack of a large increase in fiber and a more rapid digestion rate indicates that crabgrass maintains very good forage quality over a wider range of maturity than other warm-season forages.



FIGURE 3. Low fiber content of crabgrass stems leads to better than expected forage quality even at forage maturity.

Summary

Crabgrass is gaining a reputation as a high-quality forage instead of as a weed. Palatability and forage quality are excellent. It is useful for providing high-quality summer pasture or hay to support good animal performance for stocker calves, dairy cattle, small ruminants and horses. It works well in mixtures with small grains and perennial cool-season grasses. Management points are summarized in Table 3.

TABLE 3. Summary of recommendations and management practices for crabgrass for forage.

Management Practice	Recommendation	Comments
Crabgrass varieties	'Red River' 'Quick-N-Big®' Common	Known varieties are best. Common crabgrass may have unreliable variability in growth type.
Seeding rate	3 to 5 pounds per acre of Pure Live Seed	Two-year-old seed may give better establishment than fresh seed. Seeding rates up to 5 pounds may give faster soil cover.
Seeding date	Mid-April to early June	Germination begins when soil temperature reaches 58°F.
Seeding depth	Dusting to 1/4 inch deep	Sunlight stimulates germination, so shallow planting is best.
Planting method	Plant with a drill or broadcast with fertilizer or pellet lime	<ul style="list-style-type: none"> – Chaffy seed flows better when mixed with a carrier in a broadcast seeder. – Check no-till drill seed box often to ensure seed flow.
Fertility	For fertilizer and lime recommendations, use U of A soil test crop code 141, "Summer Annual Forages."	<ul style="list-style-type: none"> – Responds well to N fertilizer. – Can accumulate high nitrate levels under high N fertilizer or manure applications. – Apply N fertilizer in split applications of 50 to 60 pounds per application.
Soil adaptation	Well-drained is best	Tolerates droughty or poorly drained sites, but does not thrive in those conditions.
Reseeding reliability	Good reseeder	Can leave narrow uncut strips between hay swaths to ensure reseeding.
Compatible forage mixtures	<ul style="list-style-type: none"> – Winter annuals (small grains) – Thin fescue – Ryegrass not preferred 	Harrowing or lightly disking stimulates germination of volunteer crabgrass seed.
Grazing	<ul style="list-style-type: none"> – Avoid grazing shorter than 3 inches – Overgrazing reduces yield 	<ul style="list-style-type: none"> – Very palatable. – Usually preferred by grazing livestock but becomes unpalatable after frost.
Hay	<ul style="list-style-type: none"> – Cut at boot to early head stage 	<ul style="list-style-type: none"> – Five-year average yield in Arkansas forage trials. – 4.4 tons per acre. – Normal yield range is 2 to 4 tons per acre per year. – Dries slower than bermudagrass. – More digestible over a wider range of maturity than other warm-season grasses.

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