## Reference Guide for Texas Ranchers

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## Introduction

Effective ranch management requires a tremendous amount of information. At any given time, a ranch manager may be making decisions concerning care and management of livestock, control of noxious plants, use of fire to improve forage quality or reseeding of native pasture. The purpose of this reference guide is to consolidate some of the basic information ranch managers need for proper decision making.
This guide is not intended to be all inclusive or extremely specific. M ost of the information was adapted from Experiment Station or Extension Service publications. Some of the information represents "expert opinion" rather than the results of quantifiable research. All of the information was subjected to professional review.

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## Common Conversions

## Area:

- 1 acre $=43,560$ square feet, 209 feet $\times 209$ feet, 69.5 yards x 69.5 yards
- 1/ 10 acre $=4,356$ square feet, 66 feet $\times 66$ feet, 22 yards x 22 yards
- 1/ 100 acre $=436$ square feet, 21 feet $\times 21$ feet, 7 yards x 7 yards
- 1 section $=640$ acres or 1 square mile
- 1 hectare $=2.471$ acres

Length:

- 1 mile $=5,280$ feet, 1,760 yards or 1.61 kilometers
- 1 rod $=16.5$ feet
- 1 chain $=66$ feet
- 1 kilometer $=0.62$ miles
- 1 roll of barbed wire $=1$ / 4 mile or 1,320 feet
- 1 roll of net wire $=330$ feet or 20 rods


## Weight:

- 1 short ton $=2,000$ pounds
- 1 long ton $=2,240$ pounds
- 1 pound $=453.6$ grams or 16 ounces
- 1 kilogram $=2.2$ pounds


## Liquid Measure:

- 1 gallon $=128$ ounces, $3,785.4$ milliliters, 16 cups, 4 quarts, 8.355 pounds or 256 tablespoons
- 1 quart $=0.946$ liters, 2 pints or 32 ounces
- 1 pint $=16$ ounces or 2 cups
- 1 cup $=8$ ounces
- 1 milliliter =1 cubic centimeter (cc)
- 1 tablespoon $=3$ teaspoons
- 1 teaspoon $=5$ milliliters
- 1 cubic foot of water $=62.43$ pounds or 7.48 galIons
- 1 acre inch of water $=27,154$ gallons
- 1 barrel of water $=55$ gallons
- 1 barrel of oil = 40 gallons


## Calculation of Water Storage Capacity:

- Round tank (gallons) $=3.1416 \times$ radius squared (ft.) x height (ft.) x 7.48
- Rectangular tank (gallons) $=$ height (ft.) $x$ width (ft.) x length (ft.) x 7.48


## Pressure:

- 1 foot lift of water $=0.433 \mathrm{psi}$
- 1 psi will lift water 2.31 feet


## Livestock Husbandry

Approximate Peak Water Requirements:

- Cattle $=7$ to 16 gallons/ day
- Horses $=8$ to 12 gallons/day
- Sheep and goats $=1$ to 4 gallons/ day

Approximate Gestation Periods:

- Cattle $=283$ days
- Horses = 336 days
- Sheep = 148 days
- Goats = 151 days

Approximate Forage Intake Per Day:

- Sheep $=3.0$ percent $\times$ body weight
- Goats $=4.0$ percent $\times$ body weight
- Stocker cattle $=3.0$ percent $x$ body weight
- Dry cow $=2.0$ percent x body weight
- Lactating cow $=2.5$ percent $x$ body weight
- H orse $=2.0$ percent $x$ body weight

Guide to Use of Saline Waters for Livestock:

| Total soluble salts <br> content of waters <br> (mg./liter) |  |
| :---: | :--- |
| Less than 1,000 | Low level of salinity; should present no serious problems. |
| 1,000 to 2,999 | Satisfactory quality. May cause temporary and mild diarrhea to livestock not <br> accustomed to water. |
| 3,000 to 4,999 | Satisfactory quality. May cause temporary diarrhea or be refused at first by animals <br> not accustomed to water. |
| 5,000 to 6,999 | Can be used with reasonable safety. Caution should be used if water at higher <br> levels is used for pregnant or lactating animals. |
| 7,000 to 10,000 | Considerable risk when using this water for pregnant or lactating animals, young, or <br> animals subjected to heavy heat stress or water loss. Older animals may subsist on <br> this water under conditions of low stress. |
| More than 10,000 | Not recommended for use by livestock under any conditions. |

Minimum Weight and Age of Replacement Heifers for Puberty (Target is 65 percent of Mature Weight):

| Breed type | Age | Weight $90 \%$ in heat | Weight 70\% in heat |
| :--- | :---: | :---: | :---: |
| English | $13-16$ months | 675 | 625 |
| Exotic (European) | $13-16$ months | 776 | 750 |
| English/ exotic cross | $13-16$ months | 750 | 700 |
| Brahman/English cross | $16-17$ months | 750 | 725 |
| Brahman | $17-20$ months | 750 | 725 |

## Livestock Husbandry (continued)

Livestock Nutrient Requirements Expressed as Percent Composition of Diet on a Dry Matter Basis and as Daily Nutrients per Animal:

| Species and class | Crude protein |  | TDN |  | Calcium |  | Phosphorous |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | ozs./day | \% | Ibs./day | \% | ozs./day | \% | ozs./day | \% |
| Cow ${ }^{1}$ |  |  |  |  |  |  |  |  |
| Dry Lactating | $\begin{aligned} & 13.6 \\ & 30.4 \end{aligned}$ | $\begin{aligned} & 5.9 \\ & 9.2 \end{aligned}$ | $\begin{array}{r} 7.9 \\ 11.0 \end{array}$ | $\begin{aligned} & 52 \\ & 52 \end{aligned}$ | $\begin{aligned} & 0.4 \\ & 0.9 \end{aligned}$ | $\begin{aligned} & 0.18 \\ & 0.28 \end{aligned}$ | $\begin{aligned} & 0.40 \\ & 0.90 \end{aligned}$ | $\begin{aligned} & 0.18 \\ & 0.28 \end{aligned}$ |
| Ewe ${ }^{2}$ |  |  |  |  |  |  |  |  |
| Dry Lactating | $\begin{aligned} & 3.4 \\ & 8.4 \end{aligned}$ | $\begin{array}{\|r} 8.9 \\ 10.4 \end{array}$ | $\begin{aligned} & 1.3 \\ & 3.3 \end{aligned}$ | $\begin{aligned} & 55 \\ & 65 \end{aligned}$ | $\begin{aligned} & 0.11 \\ & 0.40 \end{aligned}$ | $\begin{aligned} & 0.28 \\ & 0.50 \end{aligned}$ | $\begin{aligned} & 0.18 \\ & 0.29 \end{aligned}$ | $\begin{aligned} & 0.26 \\ & 0.36 \end{aligned}$ |
| Doe ${ }^{3}$ |  |  |  |  |  |  |  |  |
| Dry Lactating | $\begin{aligned} & 5.0 \\ & 7.5 \end{aligned}$ | $\begin{array}{r} 9.5 \\ 11.7 \end{array}$ | $\begin{aligned} & 1.7 \\ & 2.5 \end{aligned}$ | $\begin{aligned} & 54 \\ & 62 \end{aligned}$ | $\begin{aligned} & 0.13 \\ & 0.19 \end{aligned}$ | $\begin{aligned} & 0.26 \\ & 0.30 \end{aligned}$ | $\begin{aligned} & 0.08 \\ & 0.12 \end{aligned}$ | $\begin{aligned} & 0.17 \\ & 0.20 \end{aligned}$ |
| 1992 -pound <br> 2132 -pound <br> 3 80-pound | nish doe |  |  |  |  |  |  |  |

Body Condition and Expected Pregnancy Rate of Mature Cows in 120-Day Breeding Season:

| Body <br> condition <br> score |  | Appearance |
| :---: | :--- | :---: |
| 1 | Starving; near death; no fat on backbone or ribs; wasting of muscle. | 0 |
| 2 | Very thin; backbone visible; no fat on ribs; wasting of muscle. | $0-10$ |
| 3 | Thin; backbone visible with some fat; most ribs visible. | $10-40$ |
| 4 | Backbone slightly visible; foreribs not visible; 12th and 13th ribs visible. | $60-70$ |
| $5-$ minimum target | Smooth over top, along ribs and around hooks and pins. | $80-85$ |
| 6 -desired target | Smooth over back and ribs; full hindquarters with slight fat around tailhead. | $85-90+$ |
| 7 | Very smooth and fat over ribs and tailhead; some fat in dewlap. | $90+$ |
| 8 | Large amounts of fat in tailhead and dewlap. | $90+$ |
| 9 | Obese; over-conditioned. | $80-90+$ |

## Livestock Husbandry (continued)

Average Composition of Common Feeds:

| Feedstuff | \% Dry matter | \% Crude protein | \%TDN | \%Calcium | \%Phosphorous |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Alfalfa hay | 86 | 18.3 | 58 | 2.01 | 0.28 |
| Beet pulp, dried with molasses | 92 | 10.1 | 76 | 0.61 | 0.10 |
| Bermudagrass hay | 91 | 8.9 | 48 | 0.46 | 0.18 |
| Bone meal (steamed) |  |  |  | 30.9 | 13.9 |
| Corn | 88 | 10.1 | 90 | 0.02 | 0.35 |
| Cottonseed hulls | 90 | 3.9 | 37 | 0.14 | 0.09 |
| Cottonseed (whole/ ground) | 93 | 23.1 | 84 | 0.14 | 0.68 |
| Cottonseed meal (41\%) | 93 | 44.3 | 78 | 0.21 | 1.16 |
| Dicalcium phosphate |  |  |  | 26.0 | 18.0 |
| J ohnsongrass hay | 91 | 7.0 | 51 | 0.73 | 0.28 |
| Limestone |  |  |  | 38.0 |  |
| Monosodium phosphate |  |  |  |  | 22.0 |
| Oats grain | 89 | 13.3 | 77 | 0.07 | 0.38 |
| Oats hay | 88 | 8.1 | 54 | 0.23 | 0.21 |
| Sorghum grain | 89 | 11.1 | 74 | 0.04 | 0.31 |
| Soybean oil meal | 89 | 49.9 | 84 | 0.07 | 0.27 |
| Wheat hay | 86 | 6.4 | 57 |  |  |
| Wheat straw | 90 | 3.2 | 43 | 0.15 | 0.07 |
| 20\% cube | 90 | 20 | 68 | 0.70 | 0.85 |
| 39\% cube | 90 | 39 | 69 | 0.20 | 1.10 |
| 20\% block | 90 | 20 | 57 | 1.3 | 0.85 |
| 36\% block | 90 | 36 | 48 | 1.7 | 1.1 |

Expected Shrink in Feeder Steers:

| Conditions | Time | \%shrink |
| :---: | :---: | :---: |
| Drylot | 8 hrs. | 3.3 |
|  | 16 hrs. | 6.2 |
|  | 24 hrs. | 6.6 |
| Moving truck | 8 hrs. | 5.5 |
|  | 16 hrs. | 7.9 |
|  | 24 hrs. | 8.9 |

## Livestock Husbandry (continued)

Growth Implants:

| Trade name | Manufacturer | Class of livestock |
| :---: | :---: | :--- |
| Ralgro | Pitman-M oore | For suckling calves not intended for replacements, stocker steers and <br> heifers, and feedlot steers and heifers. |
| Synovex-C | Syntex | For suckling beef calves up to 400 lbs. Not for bull calves intended <br> for reproduction, calves less than 45 days old, or veal calves. |
| Synovex-S | Syntex | For steers more than 400 Ibs. |
| Synovex-H | Syntex | For stocker and feedlot heifers. |
| Calf-oid | Upjohn | For suckling calves older than 45 days. Not for use in calves intended <br> for replacements. |
| Implus-S | Upjohn | For steers more than 400 Ibs. |
| Implus-H | Upjohn | For stocker and feedlot heifers more than 400 Ibs. |
| Finaplix-H | Hoechst-Roussel | For feedlot heifers. |
| Finaplix-S | Hoechst-Roussel | For feedlot steers. |
| Revalor-S | Hoechst-Roussel | For feedlot steers. |
| Compudose | Elanco | For suckling steers, stocker steers and heifers, and feedlot steers and <br> heifers. |

## Grazing Management

## Animal Unit:

- Commonly defines the average amount of forage consumed by a cow/ calf production unit during a year as equal to 26 pounds of dry matter per day.


## Warning Signs of Overgrazing:

- Abundance of unpalatable plants
- Distinct browse lines on woody plants
- Pedestaled plants
- Steep gully banks
- Low plant vigor
- Increased need for supplementation
- Increased livestock use of unpalatable plants
- Losses of livestock to toxic plants

Grazing Management Rules of Thumb:

- With proper grazing only 25 percent of each year's annual forage production is consumed by livestock.
- Insects, rabbits, trampling, etc. consume 25 percent of each year's annual forage production.

Approximate Dry Matter Content:

| Growth stage | Plant type |  |  |
| :--- | :---: | :---: | :---: |
|  | Mid-grasses | Short grasses | Forbs |
| nnitial to heading | $40 \%$ | $45 \%$ | $20 \%$ |
| Heading to flowering | $55 \%$ | $60 \%$ | $40 \%$ |
| Seed ripe, leaf tips dying | $65 \%$ | $80 \%$ | $60 \%$ |
| Leaves dry, stems partly dry | $90 \%$ | $90 \%$ | $90 \%$ |
| Dormant | $95 \%$ | $95 \%$ | $100 \%$ |

## Grazing Management (continued)

Animal Unit Equivalency Table:

| Kind and class <br> of livestock | Approximate <br> animal unit <br> equivalent |
| :--- | :---: |
| Cow (1,000-lb.) with calf | 1.0 |
| Dry cow (1,000-lb.) | 0.77 |
| Heifer (600-to 900-lb.) | $0.6-0.8$ |
| Steer (600- to 900-lb.) | $0.7-0.9$ |
| Bull (1,500-lb.) | 1.1 |
| Horse (800-lb. yearling) | 0.75 |
| Horse (1,000-lb. 2-yr.-old) | 1.0 |
| Horse (1,100-lb. 3-yr.-old and older | 1.25 |
| Ewe (130-lb.) | 0.20 |
| Weaned lamb (75-lb.) | 0.12 |
| Ram (175-lb.) | 0.25 |
| Nanny (70-lb.) | 0.17 |
| Weaned kid (35-lb.) | 0.10 |
| Billy (125-lb.) | 0.25 |
| Whitetail deer | 0.17 |
| Mule deer | 0.25 |
| Anit |  |

${ }^{1}$ Animal unit equivalents will vary significantly depending on the weight and physiological stage of the animal.

Suitable Plot Sizes for Vegetation Sampling with Associated Conversion Factors:

| Vegetation type | Plot dimensions (inches) | Conversion factor ${ }^{1}$ |  |
| :---: | :---: | :---: | :---: |
|  |  | Grams | Ounces |
| Arid rangeland (less than 15 inches of rainfall) | $36 \times 36$ | 10.67 | 302 |
| Semi-arid rangeland (16 to 30 inches of rainfall) | $24 \times 24$ | 24 | 680 |
| Humid rangeland (more than 30 inches of rainfall) | $18 \times 18$ | 42.68 | 1,210 |

1 Measure harvested oven-dry weight (less sack weight) in grams or ounces and multiply by the conversion factor to obtain pounds per acre.

## Grazing Management (continued)

General Description of Commonly Used Grazing Systems:

| Grazing system | Herds | Pastures | Comments |
| :--- | :---: | :---: | :--- |
| High Intensity - Low Frequency (HILF) | 1 | $4+$ | Grazing period $>14$ days <br> Rest period $>90$ days |
| Short Duration Grazing (SDG) | 1 | $4+$ | Grazing period < 14 days <br> Rest period $<90$ days |
| Merrill | 3 | 4 | Each pasture grazed 12 months, <br> rested 4 months |
| SwitchBack | 1 | 2 | Graze periods are 3 months (P-1), <br> then 3 months (P-2), then 6 <br> months (P-1), etc. |
| Rotational | 2 | $3-4$ | Graze periods vary from 4 months <br> (4-pasture) to 6 months (3-pasture) |
| Decision Rotation | a/ | a/ | Each pasture grazed 6 months, <br> rested 3 months |
| Year-long Continuous | a/ | a/ | No set movement <br> year-long |
| Seasonal Continuous | a/ | a/ | Pasture grazed during specific <br> season each year |
| a/ No specific number |  |  |  |

## Rangeland Weed and Brush Control

Common Herbicides:

| Herbicide common name | Product name | Active ingredient <br> or acid equivalent |
| :--- | :---: | :---: |
| Clopyralid | Reclaim | $3 \mathrm{lbs} . /$ gal. |
| $2,4-\mathrm{D}$ | several | Variable |
| Dicamba | Banvel | $4 \mathrm{lbs} . /$ gal. |
| Dicamba:2,4-D (1:2.87) | Weedmaster | $4 \mathrm{lbs} . /$ gal. |
| Hexazinone | Velpar L | $2 \mathrm{lbs} / \mathrm{gal}$. |
| Metsulfuron | Ally or Escort | $60 \%$ |
| Picloram | Grazon PC | $2 \mathrm{lbs} . / \mathrm{gal}$. |
| Picloram:2,4-D (1:4) | Grazon P+D | $2.5 \mathrm{lbs} . / \mathrm{gal}$. |
| Tebuthiuron | Spike 20P | $20 \%$ |
| Triclopyr | Remedy | $4 \mathrm{lbs} . / \mathrm{gal}$. |
| Triclopyr:2,4-D (1:2) | Crossbow | $3 \mathrm{lbs} . / \mathrm{gal}$. |

## Rangeland Weed and Brush Control (continued)

## Calibration of Boomless/Clusterjet Nozzle Sprayers:

- Fill spray tank with water to a marked level.
- Drive in a straight line for 660 feet, operating the sprayer at a constant pressure and speed.
- Refill the tank to the original level to determine the number of gallons used.
- Measure the width (ft.) of the area sprayed.
- Calculate as follows:

| $\frac{\text { gallons used x } 66}{\text { width of sprayed area (feet) }}$ | $=$ gallons sprayed |
| :--- | :--- |
| per acre |  |
| $=$ | acres sprayed |
| tank capacity (gallons) per tank |  |

- Add the appropriate amount of herbicide to the tank and fill.
Calibration of Boom Sprayers:
- Record the time required to travel 100 feet under spraying conditions.
- Record the number of ounces sprayed from one nozzle for the length of time required to drive 100 feet.
- Calculate as follows:
$\frac{40 \times \text { ounces sprayed }}{\text { nozzle spacing (inches) }}=$ gallons sprayed
tank capacity (gallons) = acres sprayed gallons sprayed per acre per tank
- Add the appropriate amount of herbicide to the tank and fill.
Basal Bark Application Techniques:
- Conventional basal:

Apply diesel fuel oil, kerosene or a herbicide/ diesel fuel oil mixture ( 2 to 4 percent herbicide) to the
lower 12 to 18 inches of the trunk of a brush plant. The solution is applied completely around the trunk with sufficient volume to allow runoff and puddling at the soil surface.

- Low-volume basal:

Apply a mixture containing diesel fuel oil plus 15 to 25 percent herbicide to wet the lower 12 to 18 inches of the trunk completely around, but not to the point of runoff.

- Streamline basal:

Apply a mixture containing diesel fuel oil plus 15 to 25 percent herbicide, or diesel fuel oil plus 15 to 25 percent herbicide and 10 percent penetrant, in a band ( 3 to 4 inches wide) completely around the trunk near ground level.
Addition of Surfactants to Foliar Sprays:

- 1 to 2 qts. per 100 gals. of water
- 2 to 4 tsps. per gal. water

Broadcast vs. Individual Plant Treatment:

- Fewer than 200 stems/ acre, use individual plant treatments
- More than 200 stems/ acre, use broadcast treatments


## Weed Control

- Spray when weed density is three or more per square foot.
Determining Stems per Acre:
- Mark off area 22 yards by 22 yards.
- Count stems within this area.
- Multiply the number of stems by 10 .

Recommended Tractor Size(s) for Various Rangeland Brush Control Implements:

| Implement | Recommended tractor size |
| :--- | :--- |
| Roller choppers (heavy duty) <br> less than $10 \mathrm{ft}$. wide <br> more than 10 ft. wideD7 crawler tractor <br> D8 crawler tractor |  |
| Chains (minimum 180 ft.) | D6 - D8 crawler tractor |
| Rootplows | D7 - D8 crawler tractor |
| Heavy offset disks | D8 crawler tractor |
| Front mounted grubbers <br> high energy <br> low energy | D6 - D7 crawler tractor <br> D3 - D5 crawler tractor; 35- to 120-hp farm tractor or wheeled loader |
| Rear mounted grubbers | 35- to 120-hp farm tractor |

## Rangeland Weed and Brush Control (continued)

## Quantity of Herbicide Needed to Obtain Various Concentrations:

| To mix | Concentration desired |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | $1 / 2 \%$ | $1 \%$ | $1 / 2 \%$ | $2 \%$ |
| 1 gal. | $6 / 10$ oz. or 18 cc. | $11 / 4 \mathrm{oz}$. or 38 cc. | $19 / 10$ oz. or 58 cc. | $21 / 2$ oz. or 77 cc. |
| 25 gals. | 1 pt. | 1 gt. | 3 pts. | 2 qts. |
| 100 gals. | $1 / 2$ gal. | 1 gal. | $11 / 2$ gals. | 2 gals. |

## Prescribed Burning

Red Flag Conditions for Winter Burns:

- Wind speed greater than 20 mph
- Relative humidity less than 20 percent
- Air temperature greater than 80 degrees $F$

Fine Fuel Loads for Effective Burns:

- Minimum of 1,500 to 2,000 pounds/ acre
- Optimum of 3,000 pounds/ acre or more

Diesel: Gasoline Mixture for Drip Torches:

- 60 to 75 percent diesel plus 25 to 40 percent gasoline


## Optimum Weather Conditions for Winter

 Backfires:- Relative humidity between 40 and 60 percent
- A ir temperature between 40 and 60 degrees $F$
- Wind speed between 5 and 8 mph

Optimum Weather Conditions for Winter Headfires:

- Relative humidity between 25 and 40 percent
- Air temperature between 70 and 80 degrees $F$
- Wind speed between 8 and 15 mph

Texas Air Control Board Regulations for Prescribed Burns:

- Wind speed must be between 6 and 23 mph .
- Burn must be started after 9 a.m.
- Burn must be completed by 5 p.m.
- Burn must be at least 300 feet from adjacent residential, recreational, commercial or industrial properties.
- Burn cannot be conducted when atmospheric temperature inversions are predicted.
- Burn must be outside corporate limits of a city or town.
Minimum Downwind Protection (Backfire + Mineral Fireline Width):
- Slightly volatile fuels $=50$ to 100 feet
- M oderately volatile fuels $=100$ to 200 feet
- Highly volatile fuels $=300$ to 500 feet

Minimum Mineral Fire Line Width:

- 8 feet +1 foot per mph of wind expected


## Seeding Rangeland

## Need:

- Pastures should be reseeded if desirable plants make up less than 10 percent of the total vegetation available.


## Seed Sources:

- For best results using native species, use seed grown within 200 miles north or south and 100 miles east or west of the area to be seeded.


## Seeding Depth:

- As a rule, plant seed at a depth four to seven times the diameter of the seed. When using a mixture of small and large seed, determine the planting depth by the diameter of the smallest seed. In most rangeland seedings, plant the seed about 1/ 4 to $1 / 2$ inch deep but not deeper than $3 / 4$ inch.

Timing:

- Warm season plants may be seeded successfully during late winter to early spring across most of Texas. The Trans-Pecos region is best suited to mid-summer seeding dates for warm season species. In the more southern areas of the state where a rainfall peak occurs in the fall, seeding in late summer or early fall may be more desirable.
- Cool season plants may be seeded either in the spring or early fall, though late summer or fall normally is best.


## Weed Control:

- Do not spray herbicide on areas recently seeded until grass has developed four to five true leaves.


## Seeding Rangeland (continued)

General Seeding Rates for Grasses Commonly Used in Range Seedings:

| Species | Seeding rate (lbs. of PLS/acre) ${ }^{1}$ |  |
| :---: | :---: | :---: |
|  | 40-in. rows | Drill/broadcast |
| Alkali sacaton | 0.4 | 1.0 |
| Angleton bluestem | 0.4 | 1.0 |
| Big bluestem | 2.0 | 6.0 |
| Black grama | 0.5 | 1.5 |
| Blue grama | 0.5 | 1.5 |
| Blue panicgrass | 0.8 | 2.0 |
| Boer lovegrass | 0.8 | 1.5 |
| Buffelgrass (burs/ grain) | 1.0/0.5 | $2.0 / 1.5$ |
| Buffalograss (burs/ grain) | 5.0/- | 16.0/3.0 |
| California cottontop | 0.4 | 1.2 |
| Caucasian bluestem | 0.5 | 1.2 |
| Eastern gamagrass | 10.0 | 20.0 |
| Pete and Luka varieties | 8.0 | 15.0 |
| Gordo bluestem | 0.5 | 1.2 |
| Green sprangletop | 0.7 | 1.7 |
| Indiangrass | 1.5 | 4.5 |
| King Ranch bluestem | 0.5 | 1.2 |
| Kleberg bluestem | 0.5 | 1.2 |
| Kleingrass | 0.5 | 1.5 |
| Lehmann lovegrass | 0.5 | 1.5 |
| Little bluestem | 1.2 | 3.4 |
| M edio bluestem | 0.4 | 1.0 |
| Old World bluestem | 0.5 | 1.2 |
| Plains bristlegrass | 1.0 | 3.0 |
| Rhodesgrass | 0.4 | 1.0 |
| Sand bluestem | 2.0 | 6.0 |
| Sand dropseed | 0.4 | 1.0 |
| Sand lovegrass | 0.5 | 1.5 |
| Sideoats grama | 1.5 | 4.5 |
| Switchgrass (Alamo) | 0.8 | 2.0 |
| All other varieties | 1.2 | 3.5 |
| Weeping lovegrass | 0.5 | 1.5 |
| Western wheatgrass | 2.4 | 7.0 |
| W ilman lovegrass | 0.5 | 1.5 |
| Yellow bluestem | 0.6 | 1.8 |
| 1 PLS (pure live seed) $=(\%$ germination $+\%$ hard seed) $\mathrm{X} \%$ purity |  |  |

## Suggested Additional References

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"Seeding Rangeland." Texas Agricultural Extension Service, B-1379.

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