Forage Species Selection

King's AgriSeeds Inc.
FEEDING YOUR FARM'S FUTURE.

Rod Porter – Northern Region Manager

Numerous Species

What is your favorite pasture species?

Numerous Species

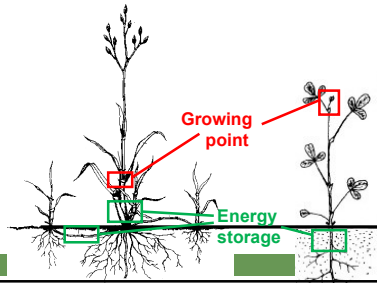
What grass do you see as the most popular with producers?

What factors influence how a species will grow?

- Soil
  - type, texture, pH, fertility, drainage…
- Weather
  - Rain, drought, heat, cold
- Animals
  - Cows vs. horses vs. sheep vs. goats vs. ??
- Producer Management
  - Grazing interval, fertilizer, paddock size

Understanding and Managing Plant Growth

Growth & Energy Points



Factors to Consider in Selection

- Adapted to Grazing/Harvest System
- Adapted to Soils
- Adapted to the Climate
- Palatability
- Longevity
- Does it Fit Producer Philosophy

Species & Varieties

- Lots of differences
  - Winter hardiness
  - Drought & Moisture tolerance
  - Palatability & Digestibility
  - Maturity dates
  - Growth Habit (prostrate vs upright)
- Origin of genetics

Forage Breeding Advancements

- Grass maturity
- Winterhardiness
- Fiber digestibility
  - More leaf, less stem
  - Softer plants (less lignin)
- Sugar Content

Species, Varieties & Mixtures

Adapted to Drier Soils

- Orchardgrass
- Bromes
- Tall Fescue
- Reed Canarygrass
- Red Clover
- Alfalfa
- Chicory

Adapted to Wetter Soils

- Meadow Fescue
- Perennial Ryegrass
- Timothy
- Kentucky Bluegrass
- Tall Fescue
- Reed Canarygrass
- Festulolium
- Birdsfoot Trefoil
- White Clover

Shorter Lived Perennials

- Festuloliums
- Perennial Ryegrass
- Italian/Hybrid Ryegrass
- Alaska Brome
- Red Clover
- Alfalfa
- Chicory

Longer Lived Perennials

- Orchardgrass
- Reed Canarygrass
- Timothy
- Meadow Fescue
- Bluegrass
- Tall Fescue
- Smooth Brome
- White Clover

Establishment

- Fast
  - Festulolium
  - Perennial Ryegrass
  - Meadow Fescue
- Moderate
  - Orchardgrass
  - Alfalfa
  - Clovers
  - Birdsfoot Trefoil
  - Brome (Meadow)
- Slow
  - Kentucky Bluegrass
  - Tall Fescue
  - Timothy
  - Reed Canarygrass
  - Brome (Smooth)

Palatability

- More Palatable
  - Meadow Fescue
  - Perennial Ryegrass
  - Orchardgrass
  - Brome
  - Timothy
  - Kentucky Bluegrass
  - Birdsfoot Trefoil
  - White Clover
  - Red Clover

Palatability

- Less Palatable
  - Tall Fescue
  - Reed Canarygrass
  - Alfalfa?
  - Over mature plants

Grazing Tolerance

- Best
  - Kentucky Bluegrass
  - Perennial Ryegrass
  - White Clover
  - Birdsfoot Trefoil
  - Festulolium
  - Meadow Fescue
  - Tall Fescue
  - Orchardgrass
  - Brome (Meadow)
- Least
  - Alfalfa
  - Timothy
  - Red Clover
  - Reed Canarygrass
  - Brome (Smooth)

Sacrifice Areas
(Can Survive Abuse)

- Tall Fescue
- Bluegrass
- Reed Canarygrass (rhizomes)
- Clover +/-

Dry Down for Hay

- Fast Drying
  - Orchardgrass
  - Timothy
  - Tall Fescue
  - Reed Canarygrass
  - Bromes
  - Kentucky Bluegrass
- Slower Drying
  - Meadow Fescue
  - Alfalfa
  - Birdsfoot Trefoil
  - Festulolium
  - Perennial Ryegrass
  - White Clover
  - Red Clover

Maturity

Species	Range in Maturity (heading date)
Bromegrass	May 9 to May 23
Tall Fescue	May 14 to May 26
Festulolium	May 17 to May 22
Orchardgrass	May 10 to May 26
Ryegrass	May 14 to June 1
Timothy	May 22 to June 5

2012 data from Cornell Trials

Yield Potential

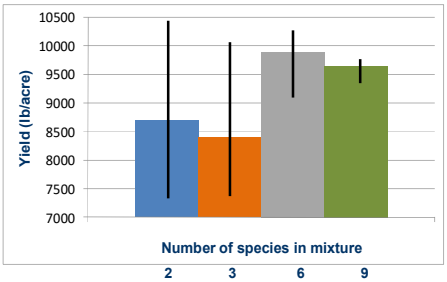
- Highest
  - Tall Fescue
  - Reed Canarygrass
  - Alfalfa
  - Red Clover
  - Meadow Fescue
  - Orchardgrass
  - Brome (Smooth)
- Lowest
  - Kentucky Bluegrass
  - White Clover
  - Birdsfoot Trefoil
  - Timothy
  - Perennial Ryegrass
  - Festulolium
  - Brome (Meadow)

Yield

Mixture	Yield (tons/a/yr)	% Stand
Alfalfa	8.2	80
Meadow fescue	5.1	31
Orchardgrass	6.5	59
Tall fescue	6.1	79
Alaska brome	5.3	5
Timothy	4.5	21
Alf - Meadow fescue mix	8.7	82
Alf – Orchardgrass mix	8.4	83
Alf – Tall fescue mix	8.2	81
Alf – Alaska brome mix	8.0	82
Alf – Timothy mix	8.3	83

Four years of data at Rock Springs Research Center

Mixture Effect on Forage Yield



Deak, Hall and Sanderson, 2007

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Reasons for Mixtures

- Diversity
- Adds Stability to Production
- Fast Starters help to Nurse Slow Starters
- Legumes Help Feed Grasses

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Which Mix?

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Mixtures

King's Grazing Mix (pg. 9)

•Highly palatable grasses & legumes for good soils with adequate moisture but not excessive.
•Orchardgrass, ryegrass, meadow fescue base
•Chicory - forbe with tap root, rich in minerals

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Mixtures

Hillside Mix (pg. 6)

•Highly palatable drought resistant species
•Orchardgrass, meadow brome base
•Ryegrass helps act as nurse crop to slower establishing brome and orchardgrass

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Mixtures

Greenfast Mix (pg. 7)

•Fast starting
•Festulolium, orchardgrass, ryegrass base
•Not drought tolerant, prefers cooler climate

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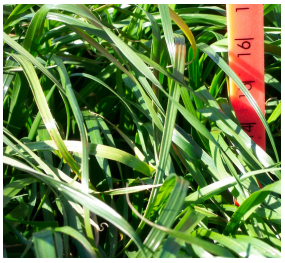
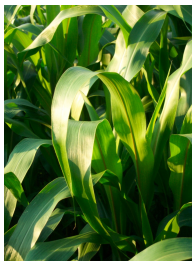
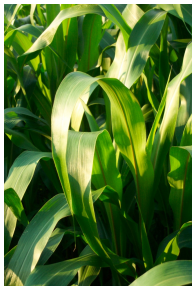
Alternative Forages



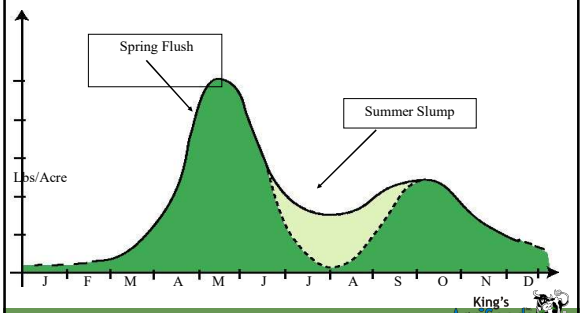


Summer Annuals

- Sorghum-sudan
- Sudangrass
- Millets
  - Use BMR-6 varieties
- Teff



Annual Production Curve for Cool Season Grass



Cool Season Annuals

- Straight Species
  - Spelt
  - Wheat
  - **Triticale**
  - Rye
  - Barley
  - **Annual & Italian Ryegrasses**
  - **Oats**
  - **Peas**
- **Mixtures**
  - Many combinations!

Annual & Italian Ryegrass

Green Spirit in New York

2008 BAR Italian Ryegrass Trial
Sown on May 13, 2008

Lot No.		2008 Yield 31-Jul	28-Aug	13-Oct	Total Season	% Heading 1-Jul	28-Aug	13-Oct
		- - - - tons per acre dry matter - - - -						
Jumbo	Annual	3.20	1.57	1.34	6.11	100	74	30
Zorro	Italian	3.06	1.31	1.65	6.03	100	70	70
Barmultra II	Italian - 2n	2.14	1.62	1.51	5.27	0	0	0
BARDELTA	Italian - 2n	2.15	1.53	1.44	5.12	1	2	0
Hercules	Annual	2.23	1.63	1.26	5.11	20	19	5
BAREXTRA	Italian - 4n	2.07	1.47	1.56	5.10	0	0	0
Marshall	Annual	2.85	1.14	1.00	4.99	100	86	36
Teff		2.11	0.67	0.80	3.58	100	52	100
BARTISSIMO	Italian	1.44	1.20	0.87	3.51	0	0	0
Spring Triticale		2.87	0.00	0.00	2.87	100	0	0
Remington	Perenial	1.21	0.82	0.80	2.83	0	0	0
LSD(.05)		0.44	0.27	0.20	0.80			
CV(%)		17.9	16.8	12.5	14.1			

BARENBRUG

Pasture Rotation

- Y1-4: Legume/Grass Pasture
- Y5 Spring: Graze 1st growth
- Y5 Summer: BMR Sorghum-sudan or Millet
- Y5 Fall: Plant cool season annuals (trit.,ryegrass)
- Y6 Spring/summer: Graze or harvest twice
- Y6 late Summer: Establish new pasture

Seeding Methods & Equipment

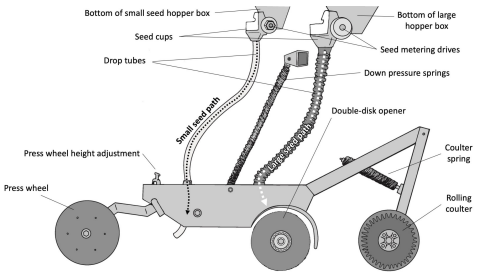
- Broadcast/Animal Tramping
- Frost Seeding
- No-till Drill
- Conventional Drill
- Drop or Packer Seeder

Broadcast Seeders

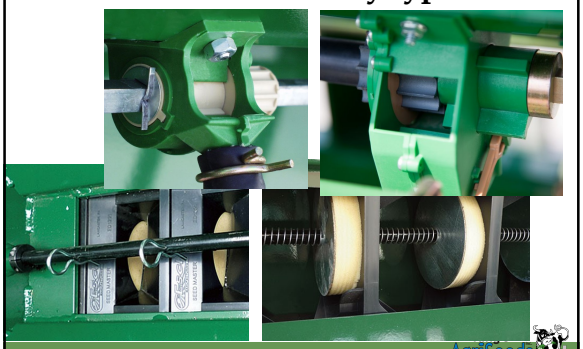
Traditional Seed Drill

No-till Seed Drills

What makes a drill no-till?



Drill seed delivery types



Drill seed delivery types

Packer Seeder

Depth & Seeding Rate

- Seeding Depth
  - Small Grains Sorghum Sudans – about 1″
  - Small Seeds – 1/8 to ¼″
    - About 10% on surface
- Seeding Rate
  - Too little seed = weeds and low 1st year yields
  - Too High – will make mix less diverse and cost money.

How do I set my equipment?

- The drill does not have my mixture on the chart!!!!
- Charts on equipment are not accurate!
  - Every lot of seed flows different
  - Calibration saves money and pays!

The Hard Ways

- Don't worry about rate.
- Trial and Error
- Do the math by yourself (weight/area)
  - Collect seed, weight it, figure out area

Read Owners Manual

- Some equipment has short cut methods such as turning a wheel 30 times and weighing seed and multiplying by a factor.

Tools Needed

- Tape measure or wheel
- Something to collect seed with
  - Drill – sandwich bag
  - Drop seeder – tarp or tray
- Postal or dietary scale
- Calibration Chart
  - Correct row spacing and distance

Drill Calibration Sheet

Row Spacing "in"	7
Distance Collected "ft"	100
lbs/A desired	1

Calculations

Area per row Acre	0.0013
ounces to collect/lb	0.0214
grams to collect/lb	0.608

Chart for different wts.

7" Drill Amount Collected	Per Row Collection	
lbs/A	oz/100ft	g/100ft
10	0.21	6.1
15	0.32	9.1
20	0.43	12.2
25	0.54	15.2
30	0.64	18.2
35	0.75	21.3
40	0.86	24.3
45	0.96	27.4
50	1.07	30.4
55	1.18	33.4
60	1.29	36.5
65	1.39	39.5
70	1.50	42.6
75	1.61	45.6
80	1.71	48.6
85	1.82	51.7
90	1.93	54.7
95	2.04	57.8
100	2.14	60.8

Row Spacing "in"	7.5
Distance Collected "	100
lbs/A desired	1

Calculations

Area per row Acre	0.001435
ounces to collect/lb	0.022957
grams to collect/lb	0.6514

7.5" Drill Amount Collected	Per Row Collection	
lbs/A	oz/100ft	g/100ft
10	0.23	6.5
15	0.34	9.8
20	0.46	13.0
25	0.57	16.3
30	0.69	19.5
35	0.80	22.8
40	0.92	26.1
45	1.03	29.3
50	1.15	32.6
55	1.26	35.8
60	1.38	39.1
65	1.49	42.3
70	1.61	45.6
75	1.72	48.9
80	1.84	52.1
85	1.95	55.4
90	2.07	58.6
95	2.18	61.9
100	2.30	65.1

For other widths simply multiply the number in the 7" columns (oz or grams) for the desired rate by your row width in inches and divide by 7"

Example 1: Need 25 lbs per acre seeding rate and have a **gram scale**.
Have a new drill with 5.5" row spacing.
15.2 grams X 5.5" / 7" = **11.9 grams**

Example 2: Need 25 lbs per acre seeding rate and have a **Oz scale**.
Have a packer seeder 10 ft and will collect all 10 ft.
0.54 Oz X 120" / 7" = **9.3 Oz**

Drill

- Determine proper rate
  - Use calibration sheet to determine grams or Oz. to collect.
- Measure 100 feet (add extra foot for seed drop)
- Take hoses off 2 - 4 rows and attach sandwich bag with rubber band or twist tie.

Drill continued

- Run drill 101 feet.
  - Check for seeding depth on rows with seed drop
  - Weigh bags with seed.
  - Average wt should be close to goal.
- If depth or rate is off, make adjustments and redo until acceptable.
- Also check for seed to soil contact. Soil needs to be firm. (usually should be packed after seeding)

Packer/Drop Seeder

- Attach tray under part of seeder
  - Get calibration chart for width of tray and distance collected
  - Follow same procedure as drill.

Or

- Lay large tarp on sod or pavement
  - Determine square ft of collected dropped seed and get an appropriate calibration sheet.
  - Carefully collect and weigh seed.
  - Make adjustments

Drop Seeder

- Distance ft. X width ft. = area sq. ft.
  Divide by 43,560 to get acreage
- Example
  - 100 ft collection distance from 10 ft drop seeder
  - Area = 100ft X 10ft = 1000 ft2
  - 1000/43560 = 0.023 Acre
  - Wt = Collected 8 oz or 0.5 lbs
  - 0.5 lb /.023 Acre = 21.8 lb/A

When Can I Start Grazing a New Seeding?

- It should be well established with a good root system.
- High risk of animals pulling up by the roots when first growth is grazed.
- Best practice is to brush hog first growth (and weeds) when ~12" or wait longer and take as a hay cutting. (60+/- days)
- Then start grazing when regrowth is 12-18"

When Can I Start Grazing a New Seeding?

- Leave at least a 4" stubble.
- Late summer seeding – do not graze til spring
- If grazing is only option, graze quickly and lightly at 12-15" (ideally only taking top 6")

Scenerios

- 5 min.
- Small groups
- Report: 2 min/group

Scenerio 1

- Low lying field near the barn
- Often used as a loafing area
- Has a slope so need quick cover

Scenerio 2

- Larger pasture on top of hill
- Tends to get dry in the summer
- Animals continuously graze this large pasture

Scenerio 3

- Excellent fertility ground
- Tends to be on the wetter side
- I have picky dairy cows and want the most palatable pasture possible

Scenerio 4

- I have a well drained field that I want to graze early and late in the season but make dry hay from during the summer

Scenerio 5

- Available pasture is limited but need to reseed this old pasture that has lots of weeds
- Field is decent soil and will be used mainly for beef but I have sheep also
- How can this pasture be rotated and reseeded?
- What species in new pasture?

Scenerio 6

- I have sandy soil and will be grazing horses
- I only want to reseed this pasture once so I want the highest yielding, longest lived species

Thank-you

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