King's AgriSeeds Inc.

High Energy Forages and Soil-Building Cover Crops

2013 Late Spring Newsletter

What's Inside

A Note From Tim

By Tim Fritz, Owner, General Manager

2013 has certainly started out very different from 2012. The big question most people immediately think of is what the price of corn will be this fall. The truth of the matter is that it could be $4 per bushel or $10 per bushel, depending on how the year turns out. One thing that we do know for 2013 is that forages will continue to be tight as acreage has been lost to corn and beans. For the livestock farmer, the bottom line continues to be the need to grow as much digestible forage per acre as possible. The cost of buying forages will remain high. This newsletter includes useful information to help you maximize productivity on your land base.

Summer Annuals

By Dave Wilson, Research Agronomist &
Genevieve Slocum, Assistant Marketing Manager

Summer annual forages are an excellent way to maintain productivity as cool-season, perennial grasses enter their summer slump. They can be utilized for summer grazing options or to grow additional feed during the summer, reducing your need for stored feed. They are good choices for filling this gap in productivity because they yield well in a short time, growing fast enough to outcompete many summer annual weeds, and due to a short (30-35 day) cutting cycle, harvesting them helps control perennial weeds as well. The summer annuals are also useful in interrupting pest lifecycles, as well as good insurance in times of drought, since many are well-adapted to hot, dry climates. Sorghums, sorghum-sudans and sudangrasses as well as grasses like teff and millet, can thrive in hotter, drier conditions than corn.

It is important to anticipate both the soil temperature requirements for correct planting dates and the harvest schedule. Plan for them in your rotation. Summer annuals can be planted separately or used to replace perennial pastures within the same field. This is sometimes known as **break cropping** – the process of breaking up your rotation by mixing annuals into perennial fields. The "renovation-rotational" effect helps eradicate perennial weeds, and the annual will often smother what's left.

AS 9301 BMR Sudan x Sudan hybrids carry the BMR (brown mid-rib) trait that makes the fiber portion of the crop highly palatable and digestible. It has strong tillering and excellent regrowth after grazings and cuttings. **AS 9301**, our popular **BMR-6 hybrid sudangrass**, has the gene 6 high quality added to its characteristic fine dry stalk (aiding quick drydown), fast regrowth, and exceptional drought tolerance. Seed it with a drill after soils have warmed to 60-65 degrees, and cut with sharp blades when the crop is 36 to 40 inches tall. Mower should be set to leave 2 nodes or 4 to 5 inches of stubble, which encourages quicker regrowth. Cattle can typically begin to graze when the crop is 18 inches tall.

Prussic acid is a concern in sorghums and sorghum-sudans in the fall; delay grazing for seven days after a hard frost, and avoid grazing when plants are very short or in a new growth stage. Avoid grazing wilted plants or plants with young tillers, and allow silage to ferment at least 6 to 8 weeks before feeding.

We carry many exceptional **BMR sorghum x sudan hybrids** as well:

- AS 6201 – A fast starter with a shorter harvest window
- AS 6401 – Improved disease tolerance, regrowth, and cold tolerance
- AS 6402 – Tolerates shorter cutting and grazing heights
- AS 6501 – Photo-period sensitive (ideal choice for one cut system)

Non-BMR stem (left) and BMR stem (right)

BMR Tillering Corn (MasterGraze) is a highly digestible corn crop suitable for a one-cut or grazing system. The MasterGraze should be planted with a corn planter, in 15 to 30 inch rows. Target a seeding rate of 36,000 to 44,000 plants per acre. Have mutilple planting dates to enable subsequent grazings. Harvested at tassel stage, MasterGraze has a high sugar content and is ideal for dairy or finishing livestock. It is ready for harvest in approximately 60 days and its tillering habit helps boost its yield (4-6 tons of dry matter per acre). Growing corn that can be grazed saves money in harvesting and storage costs, and allows the animal to benefit from the higher quality of fresh harvest.

When grazing MasterGraze, start before tasseling and plan complete grazing before ear development for optimum quality. You will need to walk or drive down the crop to run your polywire to set up grazing sections. Cattle will graze up to the wire, typically grazing the leaves of the plants first and then the stalks.

Cows Grazing Sorghum-Sudan

Wonderleaf Millet is similar to sorghum-sudan – a drought-tolerant grass, fast-growing and yielding well in dry times. The quality can be as high as sorghum-sudan, but its yields average about 20 percent lower. It likes hot summer temperatures. Once soil temperatures are warm enough for quick emergence, herbicides are rarely needed for weed control in millet. Millet is good for grazing, green chop, dry hay, and silage. Millet will do somewhat better than the sorghum-sudan on wetter soils. Millet can be fed to horses and mules, in addition to livestock.

Brassica crops, such as turnips or radishes, are often planted as cool season annuals, but are productive forages in the summer, high in protein ranging from 16 to 32% and lack the lignification potential of many grasses. They can be seeded alone or with annual grasses for more fiber and better digestibility. Either way, make sure to introduce livestock to these crops gradually and supplement with adequate fiber to slow the rate of passage and allow for proper digestion.

Corvallis Teff is a small-seeded grass that needs very careful planting management. Accurate seedbed preparation and planting are critical with teff. If managed correctly, it will yield an excellent hay crop and can fill the summer gap left by the cool season grasses. It typically makes two cuttings throughout the summer season. For grazing applications, the key is to cut the first harvest, then manage graze subsequent harvests.

"We were very well pleased with the AF 7401 Forage Sorghum; it helped stretch our hay and corn silage through the fall. It yielded well, I was impressed with it, and definitely will plant it again."
-Alan Frantz, dairy farmer, Waynesboro, Franklin

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"ALTA SEEDS GROWER EXPERIENCES"

Thin Alfalfa Stands

By Tim Fritz, General Manager

Many older alfalfa fields look weak in different regions. If your stand is not thick enough (approximately 40 stems per square ft according to Dr. Marvin Hall, Penn State University), consider interseeding a summer annual such as sorghum sudan or sudangrass, or rotating to Masters Choice corn for silage.

Success for Summer Annual Alfalfa Interseeding

1. Ensure that a residual herbicide program will not impact your summer annual choice.
2. Confirm minimum daily soil temperatures have reached 60 degrees F and predicted to stay warm. In most years this usually means taking two aggressive cuts before seeding or delaying the first cutting.
3. Prior to seeding, control grasses and weeds with an appropriate non residual herbicide, or if organic, consider a light discing. Summer annuals do not interseed well into grasses or weeds but work well seeded into alfalfa and red clover.
4. No-till approximately ½ to 2/3 of suggested full seeding rate depending on alfalfa density.
5. Seeding depth is critical
   - Sorghum sudans – Seed into moist soil at a minimum of 1" depth and a maximum of 2". If soil is dry, risk is very high.
   - Sudangrass – Seed into moist soil at a minimum of 1/2" depth and a maximum of 1". If soil is dry, risk is very high.
   - Teff – Broadcasting and cultipacking may be as effective as a very shallow no-till seeding. The key is timing before a nice rain. Risk is high, but the seed cost is low.
6. Time alfalfa harvest as normal, but raise cutting height to a 4" minimum. AS6402 dwarf sorghum sudan will tolerate shorter cuttings if you cannot raise the cutting height.
7. Assuming interseeding was successful, apply up to 25-35 units of Nitrogen and some sulfur after first cutting on the newly seeded summer annual. If soil is healthy and high in organic matter, you may not need any nitrogen. Do not over apply nitrogen or manure.
8. Test forage before feeding, including NDF digestibility and nitrates.

"Confirm minimum daily soil temperatures have reached 60 degrees F and predicted to stay warm."

Planting Later Corn for Silage

Corn silage is the most consistently successful summer annual forage and will yield the highest tonnage but of course it will not be ready for harvest for about 3 months, depending on hybrid choice and other factors. Adding a warm season annual grass has the potential to increase yield, but does require attention to detail. (See interseeding into thin alfalfa check list).

When planting corn silage on the later side, use some caution on hybrid selection for your local area. In general, if you are not in a hurry for harvest stay with hybrids that are on the full maturity side for you local area. This will help you maximize yield. In addition, avoid hybrids that are susceptible to foliar diseases if you are in a high disease pressure area as disease pressure is usually higher in a late planting scenario. Corn borer pressure can also be higher especially in extreme late plantings. Thick, dense-stalked hybrids offer some natural tolerance in a silage setting but are not perfect. Corn borer tech products such as 3000GT and Viptera (VIP) hybrids offer great protection, if they fit your program and philosophy. One final note, keep in mind that hybrids planted late tend to grow taller than those planted early if adequate moisture is available.

In this year of tight corn seed supply here is a list of hybrids that we have in good supply that we believe are great choices. This is not a list of all products available, and you may choose other hybrids as well. Note: Hybrid availability subject to change.

Conventional Hybrids

MC 480 -87 days – North of I-80
MC 4050 – 90 days
MC 4560 – 95 days - North of I-76/70
MC 5320 – 103 days
MC 530 –105 days North of I-80
MC 583 – 111 days
MC 6470 -114 days

Tech Hybrids

MCT 480 GT – 87 days – North of I-80
MCT 4281 GT – 92 days - North of I-76/70
MCT 4564 VIP 3111 – 95 days - North of I-76/70
MCT 4881 GT – 98 days
MCT 5324 VIP 3111 – 103 days
MCT 583 LL, 3000GT, VIP3111 – 111 days
MCT 6583 3000GT – 115 days
MCT 6751 -117 days – South of I-76/70

Cover Crop Mixes

By Dave Wilson, King's Research Agronomist

When you want a cover crop to meet several needs simultaneously, consider a seed mixture. The multiple species in a mix add biodiversity to your field, and you can often achieve a synergy of beneficial effects from the various species in the mix. For example, if you plant a mixture of winter annual legumes and an annual grass (such as oats), you can achieve a succession effect, in which the annual grass will grow quickly, will often winterkill, and provide sheltering biomass for the emerging legumes, which will take off in the spring. Legumes fix nitrogen and scavenge nutrients with a deep taproot, while grasses anchor soil and add organic matter with a dense fibrous root mass. Crops like Daikon Radishes, if planted early enough before the first killing frost, can be added for the "drilling" effect that the thick taproot can achieve. It grows downwar, breaks up hardpans down to several feet below the surface, scavenges nitrogen and other leached nutrients, and grows a dense, weed-suppressing leafy canopy. Some cover crops like brassicas exude pest-deterring substances, while others, like rye, are allelopathic, secreting chemicals that inhibit some weed germination.

"...many growers find that they benefit from the soil coverage and nutrient-catching capabilities of these crops and still get a cutting or two of high-quality forage from it"

The more species you mix together, the greater the resilience of the system, since some species can take over when others are struggling or dying out. Working with mixtures gives us more flexibility, virtually guaranteeing that we will be able to meet the unique needs of your location, soil and crop rotation.

In situations where we can let cover crops go to bloom, each species may also attract a different type of beneficial insect, which together can provide a powerful "break crop" to disrupt insect, weed, and disease cycles. In addition, many growers find that they benefit from the soil coverage and nutrient-catching capabilities of these crops and still get a cutting or two of high-quality forage from it. If this is your goal, we often recommend a higher seeding rate and fertilization at planting or spring green-up.

Our popular **3-Way Clover Mix** provides a unique balance of above- and below-ground growth. The medium red clover puts on ample leafy growth, the ladino white clover adds diversity by contributing fine stems and roots, and the yellow blossom sweetclover contributes a thick, deep taproot, and excellent vegetative growth the second year. The mixture feeds microbes and worms in the soil with the high volume of organic matter it leaves behind.

3-Way Clover Blend

Broadcaster is another popular mix that balances the benefits of a wide variety of crops and is convenient for overseeding or interseeding in a growing crop. It combines Annual Ryegrass, Crimson Clover, Common Medium Red Clover, Daikon Radish, and Yellow Sweet Clover. This is a great combination of the deep thin fibrous root of grass, deep taproots and good canopy of the clovers and radishes. It is also excellent for early spring grazing or cutting for baleage before corn.

CARGO, a combination of Crimson Clover, Annual Ryegrass and Oats works well as a late summer/early fall planted cover crop or as a forage mix. The oats provide the early cover mentioned, and the crimson clover and annual ryegrass overwinter as a grass-legume cover. If using this as a forage combination, target a planting date in August and increase the seeding rate from 60#/acre (as recommended for cover crop use) to 120#/acre. This will give you a nice cutting of oats in the fall (or a possible grazing), and then the grass-legume mix can overwinter to provide a soil cover and produce nutritious forage for baleage in the spring or an early spring grazing option.

Holes Left Behind From Daikon Radish Cover Crop

Soil Fertility For Forage Production

By Rod Porter, Northern Region Coordinator

The advantages of high quality forages are increased energy, digestible fiber, quality protein and balanced minerals. To obtain these advantages, your soil needs to have the right balance of nutrients and minerals, much like balancing a ration. If a cow's ration is not balanced, she loses yield (milk) and quality (components and body condition). Balancing soil fertility is no different. The forages and pastures we grow need the same nutrients and minerals that our cows do in order to achieve yield and quality. Let's take a look at some nutrients and minerals to see how they affect forage quality.

"It is much cheaper to stay ahead with fertility than to try playing catch-up, and yield will improve dramatically."

Calcium is the foundation of the whole fertility program. If this is not in balance, many of the nutrients and minerals may not be available for the plant to use. Once in balance, your pH will be in the correct range also. This increases nitrogen utilization, which in turn increases the protein content of the forage.

Nitrogen is directly linked to increasing the protein level in forages. Lack of nitrogen affects chlorophyll production and results in lower energy absorption from the sun. Plants low in nitrogen mature earlier. Nitrogen is also essential for the production of vitamins and energy systems in the forage. It is an essential component of amino acids, which form plant proteins.

Phosphorus plays an important role in photosynthesis and respiration, influencing energy storage and transfer, cell division and cell enlargement. Phosphorus improves the overall quality of the forage by building a store house for the plants energy, protein, minerals and nutrients.

Potassium is essential for protein synthesis. It is important in breaking down carbohydrates, a process which provides energy for plant growth. It aids the plant in overcoming the effects of diseases. Potassium is involved in the activation of more than 60 enzyme systems which regulate the rates of major plant reactions. Legumes utilize more potassium than grasses. When potassium is too high, it can affect palatability and digestibility of the forage.

Sulfur increases forage quality and affects the quantity and quality of protein. It releases energy in the cells and is part of Vitamin B1 and biotin. (Since air quality has been improved, we need more sulfur)

Zinc builds chlorophyll, helps enzymes function correctly, affects growth hormones in the plant, and affects elongation of internodes.

Boron is needed in only small amounts, but most soils are low as boron is not easily stored in soil. It is very important in the plant's nutrient intake of calcium and other minerals. It aids in cell wall formation, sugar transfer, energy release in cells, protein production and improves overall forage quality.

Copper helps control molds and fungi, aids in chlorophyll production and photosynthesis, helps enzymes function properly, and helps with the immune system of the plants.

In summary, we need to build adequate, balanced levels of nutrients and minerals in the soil to produce high-energy, high-quality pastures and forages. In grazing dairies, cows will have a higher dry matter intake if the pastures have adequate levels of calcium, phosphorus, sulfur and trace minerals. These same forages will have higher sugar levels, which help to improve their digestibility, since this energy is readily available energy for rumen microbes. With higher sugars, less starch is needed and fiber levels are maintained for rumen functions.

Points to Remember

- Every time grasses are cut or grazed, roots will slough off. This fast cycle of root growth and die off is why grass has the capability to build organic matter.
- Clover and other legumes have the ability to produce lots of nitrogen, improving soil fertility
- Fertility has tremendous influence on tillering and persistence.
- Having lots of tillering going into summer will extend grazing longer into a drought due to the fact of the aggressive new life in the tillers.
- Fertility is a big factor in a stands ability to thrive under various pressure.
- It is much cheaper to stay ahead with fertility than to try playing catch-up, and yield will improve dramatically.

Perennial Grazing

By Joshua Baker, King's Marketing Manager

When Aaron King founded Kings AgriSeeds in 1993, his intent was to share the benefit that he experienced from utilizing the highest quality seed genetics available on his grazing dairy operation. Twenty years later, Kings still holds on to our roots by sourcing the best seed genetics and providing industry leading agronomic and nutritional advice. One topic that continues to be recycled is grazing management. While grazing can pose some challenges, we also see significant benefits from getting cows out on pasture. Hopefully this is all just a refresher for our graziers so I'll make it short with a few refresher points:

- Have plenty of high- quality pasture available. Livestock perform better on a dense 8 inch stand than a 15 inch stand.
- Be mindful of quality. Your grazing height window is from 8 inches back down to 3 inches. This height range provides the highest nutritional quality for livestock.
- Move cows off when residual height is reached. Do not graze below 3 inches for perennial grasses.
- Wait until grass height reaches 8 inches before grazing. Consider your fences as tools to keep livestock OUT rather than keep them IN. Keep them off of pastures that have not reached adequate height. To get the most return for your cost of seeding a new perennial stand, you need to manage for longevity. Keeping the cows in a sacrifice area and supplementing until your pasture reaches the appropriate height, is the best way to ensure that you maintain a productive stand for many years. Overpressuring grass causes it to be slower to bounce back, decreases yield and decreases longevity.

"Consider your fences as tools to keep livestock OUT rather than keep them IN."

- Fertilize. If you expect yield, you must add fertility periodically. The increase in yield can easily be payback for the added expense of fertility.
- Balance ration according to quality of pasture. Considering the growth of perennial pastures, feed supplements may need to be adjusted to make accommodations (i.e. keep fiber levels adequate)

Recommended mixes for grazing:

- **Creekside**
- **Greenfast**
- **Hydromaster**
- **Dairy Green**
- **Beefmaster**
- **Southern Beefmaster**
- **Horse Supreme**
- **Equinemaster Pasture & Paddock**
- **Graze All**
- **Kings Grazing Mix**

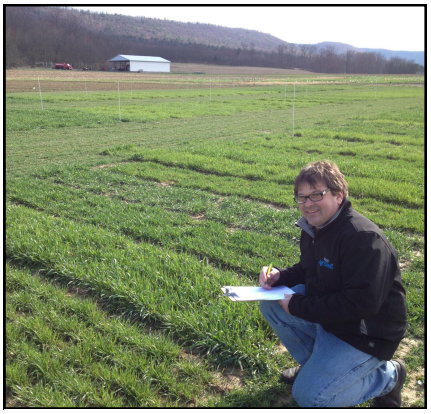
Research Update

By Genevieve Slocum, Assistant Marketing Manager

King's experienced, highly technical staff will be conducting detailed on-farm research to test our product line – both new and continuing – year after year at several locations throughout the Northeast.

This past winter, we were flooded with questions about how to frost-seed. It was one of the most popular questions at each of our winter meetings (which we hold to educate customers), so we decided to let this need drive some of our research. We set up an evaluation of seven of our frost-seeded clovers into strips of fall-planted winter wheat at different seeding rates. Simulating a system in which a clover stand is established into a small grain to be cut for forage, we will evaluate the clovers' germination and progressive biomass heading into the spring and summer.

In the fall, we established a "systems trial" on the farm of our Lancaster County collaborator, which uses a series of strip plots to simulate nine different farming systems. Following each system over several years, we will conduct a long-term comparison of various forage rotations, using our current winter annual small grain forages, corn and other summer annuals in rotation to sample yields and quality. We plan to plant alfalfa and a grass combination in some of these, and expand the evaluation to include a comparison between a perennial grass alfalfa mix and several rotations including summer and winter annuals.



Plot Evaluation– Tim Fritz

Tracy Neff, King's Agronomist, will coordinate the continued evaluation of

Masters Choice corn hybrids, in which we will be comparing experimental hybrids with the current commercial line at several locations. We've also entered hybrids at Virginia Tech trials, Professional Dairy Producers of Pennsylvania (PDMP) trials, and Cornell University trials. Tracy is also helping with the screening of genetics for a spring oat evaluation and summer annuals for a summer annual trial. In early April, he planted some new grasses to look at in a Mount Joy, PA research location, with several alfalfas and alfalfa-grass mixtures. King's also plans to again assist colleagues at Syngenta with an ongoing evaluation of new and current winter triticale genetics.

Dave Wilson, King's Research Agronomist, represents King's on the advisory board for several projects in conjunction with Penn State University to evaluate cover crop mixes. These trials span several locations and seek to evaluate the mixes in organic and reduced tillage systems, in which a roller-crimper is used to create a killed weed-suppressing mulch mat from the cover crop. With the help of a USDA Conservation Innovation Grant (CIG), the researchers are also expanding their evaluation of the Penn State Interrow Seeder, used to overseed a cover crop into corn. Three of these will be built this year, and tested at on-farm locations in Maryland, Pennsylvania, Vermont, and New York. Last year, Dave was involved in the preliminary evaluation of different species and mixes to use in the interrow seeder, and looks forward to expanding these treatments to new cover crops and working with a modified prototype of the seeder this year.

Genevieve Slocum Frost Seeding Clovers for Trial

Looking Forward to Late Summer

Did you know that depending on your location, August/September is the next major window of planting forage crops? Late summer is also the best time of year to inter-seed thinning pastures and hayfields.
Crops that work great in this time period include:

- **Perennial crops such as alfalfas, clovers, and most perennial grasses and mixtures.**
- **Annual and Italian Ryegrass for fall harvest and spring harvests.**
- **Oats for fall forage production**

The best timing depends on your location and the weather patterns of the year. In general, sometime in mid-August the nights become longer, morning dew becomes common, and assuming you have moisture in the soil the risk level of seedling failures become very low. For perennials, the idea is to get them established in late summer while weed pressures and desiccation risks are low. This should be done about six weeks prior to hard freezes.

HERE'S WHAT THEY SAY

"I liked what I had heard about Masters Choice so I grew some in 2012. Despite the droughty conditions, the MC480 yielded very well. It tested high in sugars and my cows responded very well with an average of 3.7 lbs. more milk."
-Jason Mesch, Collins, NY (southwestern NY)

"We were very well pleased with the Alta Seeds Brachytic Dwarf Forage Sorghum; it helped stretch our hay and corn silage through the fall. We used it mainly for our heifers and dry cows. It yielded well, I was impressed with it, and definitely will plant it again." ***-Alan Frantz, dairy farmer, Waynesboro, Franklin County, PA***

From utilizing MC's 'Feeding Type' hybrids (silage and grain) in his high forage ration for his Jersey herd to finishing steers, John and his family lean on MC to provide their livestock with the requirements they need to maximize milk or meat. John and family are sharing their success with MC throughout the local community by sharing their high forage ration formulas with the local farm community. Kings and MC are excited about partnering with the Burkholders in 2014 to continue producing high quality feed. ***-John Burkholder, Fleetwood, PA***

"There are two things that I enjoy most about working at King's AgriSeeds, Inc. The first is the mentality at King's "We want to do the right thing". That might mean recommending a fertility application or soil amendment application or changing a management practice prior to recommending seed. The second thing is the knowledgeable staff of experienced agronomists and nutritionists that I can consult with when making recommendations for a customer. No one person can have all the answers, and it is so nice to consult with another King's staff member about a customer question to make the correct recommendation." ***-Tracy Neff, King's Support Agronomist (With King's for 8 Years)***

When we switched from using a competitor's granular product to using Agmaster Water Soluble Corn Silage treatment, fermentation time decreased dramatically. We also saw an improvement in bunk stability and more resistance to spoilage when ag bags were damaged. At one point, we had some silage that went up at 45% moisture. We added water and treated it with Agmaster and it ended up making great feed for our dairy herd. ***- Dan Beary, Beary Farms Cambridge Springs, PA***

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