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Serving your Seed & Soil Fertility Needs Since 1995

Sheep Catalog, 2022

Forages for Sheep

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FSM Brand

Using Forages in Typical Ohio Sheep Systems

The last decade or so has been a boom for lamb producers in North America. Demand and live lamb prices have been the highest in my lifetime. The result has been many farms adding or switching to sheep production. As a long-time sheep producer, I would suggest that the keys to profitability are achieving consistent multiple marketable lambs per ewe and minimizing feed cost without shorting the ewes or lambs nutritionally. While adopting a production system to capture maximum price per lamb should be considered, the fixed (buildings) and variable (harvested or purchased feed) costs need to be weighed to maximize the bottom-line.

While the most profitable system will vary with geography, market access, and existing fixed assets, maximizing the use of home-raised forage can help maximize return on investment in any system.

Regardless of the production system, there are three periods during which the ewe flock requires higher levels of nutrition: pre-breeding (flushing), late-gestation (last 4-6 weeks), and lactation (4 to 12 weeks). In addition, lambs begin to nibble feed when only a week or two old. They need adequate supplemental nutrition to achieve marketability as soon as possible.

Adapting and managing on-farm forage production to meet nutritional demands can be tricky... but it is the most cost-effective approach to nutrition.

During the month or so prior to breeding, both ewes and bucks need an increase in digestible energy and adequate minerals in the diet to put on the condition needed for breeding activity, and to encourage multiple ovulations in ewes and healthy sperm production in rams, during the last trimester rumen space becomes limited.

While nutritional requirements increase as lambs grow in-utero; therefore, ewes require more highly digestible, nutrient dense forage or limited grain supplementation, especially when carrying twins or triplets. After lambs are born, rumen space is greater allowing for increased consumption of forage; however, high energy density and adequate protein are necessary to support maximum milk pro-duction and corresponding early lamb growth. Finally, young lambs require adequate protein and highly digestible energy in a dense form because of limited abdominal capacity and limited rumen development.

The easy solution is to purchase a bag of commercial pellets or supplement shelled corn. However, it may be more profitable to produce and utilize appropriate quality forages during these periods of higher nutritional need.

FSM Products for each Lambing System

Winter Lambing

FSM Product	RFQ range*	Crude Protein*	Maintenance	Flushing	Early-Mid Gestation	Late Gestation	Lactation	Lambs
HQ-F (pasture)	A:90-110; B:110-140; C:140-165	11-21%	A	B+,C	A,B-			C
HQ-W (mixed hay)	A:80-110; B:110-140; C:140-155	12-21%	A		A,B-	B+	C	C
Cow Candy II BMR Sorghum-sudan	A:90-110; B:110-140; C:140-145	10-16%	A	B+,C	A,B-	B+	C	C
OPTimum II (oat/pea mix)	A: 60-110; B:110-140; C:140-150	7-18%	A		A,B-	B+		
Dessie's teff	A: 85-110; B: 110-140	8-16%	A		A,B-			
Rye/ Triticale	A:60-110; B: 110-140	7-15%	A		A,B-			

Spring Lambing

FSM Product	RFQ range*	Crude Protein*	Maintenance	Flushing	Early-Mid Gestation	Late Gestation	Lactation	Lambs
HQ-F (pasture)	A:90-110; B:110-140; C:140-165	11-21%	A,B		A,B-	B,C	B+,C	B+,C
HQ-W (mixed hay)	A:80-110; B:110-140; C:140-155	12-21%		B,C	A,B-			
Cow Candy II BMR Sorghum-sudan	A:90-110; B:110-140; C:140-145	10-16%	A,B	B,C	A,B-			
OPTimum II (oat/pea mix)	A: 60-110; B:110-140; C:140-150	7-18%			A,B-			
Dessie's teff	A: 85-110; B: 110-140	8-16%	A,B		A,B-			
Rye/ Triticale	A:60-110; B: 110-140	7-15%			A+,B-			

Fall Lambing

FSM Product	RFQ range*	Crude Protein*	Maintenance	Flushing	Early-Mid Gestation	Late Gestation	Lactation	Lambs
HQ-F (pasture)	A:90-110; B:110-140; C:140-165	11-21%	A,B-	B+,C	A,B	B+	B+,C	C
HQ-W (mixed hay)	A:80-110; B:110-140; C:140-155	12-21%	A,B-	B+,C		B+	B+,C	C
Cow Candy II BMR Sorghum-sudan	A:90-110; B:110-140; C:140-145	10-16%	A,B-		A,B		B+,C	
OPTimum II (oat/pea mix)	A: 60-110; B:110-140; C:140-150	7-18%	A,B-			B+	B+,C	
Dessie's teff	A: 85-110; B: 110-140	8-16%	A,B-		A,B			
Rye/ Triticale	A:60-110; B: 110-140	7-15%	A+,B-					

*Based on 2017-2019 data for similar products from the Midwest US analyzed by Rock River Labs. While our FSM Brand products have the genetic potential to reach the higher end of these ranges, actual performance will be strongly influenced by harvest maturity, fertilization, growing conditions, etc.

The Three Primary Lambing Systems in Ohio

There are three primary lambing systems used in Ohio: winter lambing for the early spring seasonal market, spring lambing for feeder or fed lamb production, and fall lambing for the early winter seasonal market. High quality forages can be utilized in each of these systems to meet nutritional needs while reducing costs.

WINTER: In the winter **(November - February)** lambing system, high quality grass and white clover pasture or sorghum-sudan interseeded with a brassica for grazing work well to prepare the flock for breeding in summer. Late gestation and lactation typically involve stored feed often fed in confinement or semi-confinement.

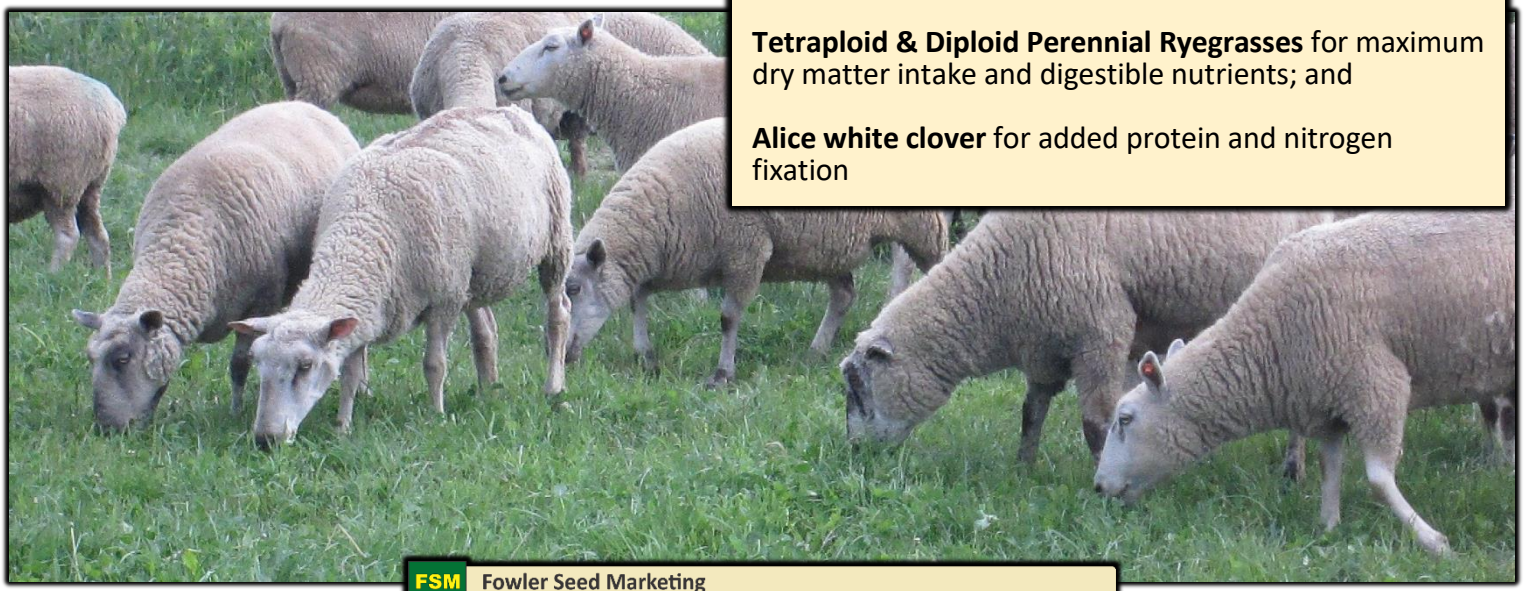
Well-made alfalfa/grass hay mixtures harvested dry or mold-free, wrapped 'sweet' hay (20-30% moisture) with 12-18% protein and a Relative Feed Quality* (RFQ) of at least 135 (higher as air temperature decreases and/or for ewes carrying and nursing multiples) should provide adequate digestible energy for late gestation, lactation and early lamb growth. Mature or stockpiled pasture, small grain forage, row crop residues, lower quality hay (RFQ below 110) can be fed after weaning and in early to mid-gestation.

In this system, it may be beneficial (although probably frustrating to both the sheep and the shepherd) to limit flock access to spring pasture in favor of high-quality hay production for the critical nutritional periods.

SPRING: (March – June) In Ohio, this system typically corresponds to the spring pasture 'flush'. Ewes are turned on to lush pasture during late gestation and maintained in lactation as long as good grass holds out. Proper mineral content and balance are needed in spring pasture to prevent metabolic issues, such as grass tetany. Summer annuals such as BMR sorghum-sudan or teff can be used to extend grazing during the summer 'slump' but need to be planted on-time to be ready to graze when needed. Lambs being finished on grass need priority access to high-quality forages to maximize growth rate.

Including hybrid forage rape with BMR sorghum-sudan can increase the protein and energy level of summer forage for lambs and can later be used to flush the ewes. Low to moderate quality hay (RFQ 90-120), mature or stock-piled pasture, crop residues, or fall-planted Aroostook rye or triticale can be utilized during the winter to cost-efficiently maintain the flock through the winter.

FALL: (July- October) In Ohio, this system presents some of the greatest market opportunities as well as most difficult forage challenges, especially early in the window. Flushing the flock on spring pasture is easy enough in April and May, not so much in February and March. Foliar feeding the pasture can improve the mineral balance and nutrient density of early spring pasture.



The Three Primary Lambing Systems in Ohio

High-quality stored forage (RFQ 135+) or shelled corn with vitamin and mineral supplementation are likely necessary before spring pastures are ready. Pasture production during July, August and September is highly dependent on adequate fertility and rainfall. In this system, growing high quality summer annuals or having the ability to pasture 2nd, 3rd, 4th cutting alfalfa/grass fields as needed are probably essential to utilizing forages in this system.

Late fall and winter grazing needs to be grown and set aside earlier in the growing season by stock-piling pasture or planting a combination of winter-hardy small grain and brassicas. Since lambs in this system are typically marketed in November through January, lower quality forage or crop residues are generally adequate, unless housed outside with minimal shelter, for the ewe flock during the remainder of the winter.

Accelerated lambing (aka: STAR system) is a hybrid of the systems previously discussed. The goal of accelerated lambing is to breed back ewes within 60-90 days of lambing resulting in a continually rotating lambing window for the flock. From an economic perspective this system sounds great! Reducing or eliminating the cost of 3 to 5 months of maintaining the ewe flock per year and adding two additional lamb crops every three years should increase the bottom line.

In reality, intense nutritional management, especially if trying to maximize the use of forages, is critical along with proper breed selection to achieve out-of-season breeding. Over the years we have found that some of our ewes would breed back out-of-season every second or third pregnancy, but not every time.

We also found that ewes had fewer multiple births in the accelerated pregnancy than after a rest period. An almost continual supply of highly digestible, high-energy forages along with supplemental grain and minerals in available form are essential if trying to make this system work.

While it may be economically wise and nutritionally necessary at certain times to utilize grains, commercial supplements and complete feeds, there is opportunity to reduce feed cost in any of the various sheep production systems typical to Ohio by raising and utilizing appropriate quality forages. In the chart on page 3, various FSM brand products are shown to fit the nutritional windows of each system.

Relative Feed Quality (RFQ) is a feed value calculation that accounts for protein, non-fiber carbohydrates, and both the quantity and digestibility of fiber. It is a more accurate representation of feed value for improved grass forages then Relative Feed Value (RFV) which does not account for fiber digestibility

BARENBRUG BarOptima+E34

A highly productive, dense, soft-leafed tall fescue with ***E34*** an animal friendly endophyte which enhances the plant's resistance to heat and drought tolerance without harming livestock.

Trials in Arkansas showed **BarOptima + E34** had a 59% greater yield than harmful endophyte infected KY-31.

Increase your bottom line with better quality, more persistent forage and greater livestock gains!

FSM Brand

FSM Brand Bio-Enhanced Pasture Fertility Program

Early Spring Application-Greenup

MVP*	2 gallon/acre
Starter Blend or PKT 18*	4 gallon/acre
Dramm ONE fish*	2 gallon/acre
Magnesium Sulfate*	1-2 pounds/acre
Residue WS*	1/10th lb/acre

Late Spring/Early Summer Application

MVP*	1 gallon/acre
Forage Boost or Premium Blend 18	4 gallon/acre
32% N or Dramm ONE*	3 gallon/acre
Magnesium Sulfate*	1-2 pounds/acre

Late Summer/Early Fall Application

MVP*	1 gallon/acre
Premium Blend 18*	4 gallon/acre
32% N or Dramm ONE	3 gallon/acre

*Products generally acceptable for organic production

BARENBRUG Remington+*NEA*2

This perennial ryegrass forms an unusually dense sward for a tetraploid variety, producing exceptional yields of energy rich forage as hay or pasture.

Very late to head and stress tolerant, Remington+NEA2 contains an animal friendly endophyte enhancing the performance of the ryegrass through periods of heat and drought without harming livestock.

Pasture Management for Sheep in Ohio

Depending on the lambing system used, the role of pasture will vary. As previously discussed, a productive pasture is most beneficial in a spring lambing system where both ewes and lambs depend on it for the bulk of their nutrition, but it can also have an important role in flushing, maintenance and gestation in fall and winter lambing systems.

On most soils in Ohio, blends of soft-leafed tall fescue, meadow fescue, perennial ryegrass, and white clover are best suited for sheep pasture. These species are productive, palatable and tolerant of occasional tight grazing.

We developed the FSM Brand HQ-F pasture mix (see page 4) containing these species on our farm under a sheep and beef cattle rotational grazing system. While this endophyte-free blend is adapted to most soils in Ohio, heat and drought are a greater concern for pastures in Central and Southern Ohio.

By substituting BarOptima+E34 soft-leafed tall fescue and Remington+NEA2 perennial ryegrass both with an animal-friendly endophyte, we can enhance the heat and drought tolerance and thereby the performance of the pasture mix in Southern Ohio.

Realizing the genetic potential of an improved pasture depends on proper management. With sheep on this type of pasture, the goal is to turn stock in at 8 to 10 inches of height and remove them at 3 to 4 inches. As turn-in height increases, trampling waste also increases (especially in wet conditions).

Grasses store energy for regrowth in the lower, wrapped part of the stem. Grazing lower than 3 inches can damage these reserves: seriously impacting the ability of the sward to recover, reducing season-long yield, and extending the time between grazing cycles (especially in hot, dry weather). On poorly drained, easily compacted soils (like our Ashtabula County silt loams) limiting animal traffic when soils are saturated is critical to maintaining the long-term productivity of the pasture. Both overgrazing and compaction limit the productivity and longevity of an improved pasture.

In a **spring lambing system**, ewes lamb on spring pasture with grass being the primary feed source of nutrition for both lactating ewes and growing lambs into the summer. Among the concerns that should be addressed with spring pasture are phosphorous (P) and magnesium (Mg) deficiency in the forage, overall poor mineralization of the forage and maintaining pasture growth into the typically dryer summer months. Even if P levels are adequate on a soil test, availability is limited in spring by soil temperatures below 65F and pH levels below 6.2. Likewise, plant tissue tests often reveal Mg deficiency (associated with grass tetany) in the plant even when soil tests show adequate to excessive Mg, especially during temperature or moisture extremes throughout the grazing season.

Too often sheep pasture is an otherwise unusable piece of land and as such is often lacking in overall mineral nutrition for the grass. Adequate spring moisture stimulates rapid growth, but a lack of mineralization causes a phenomenon known as “washy” grass. Animals can be full but not perform well because the forage lacks nutrient density.

These problems in spring pasture can be cost-effectively corrected with one foliar application of our **FSM Bio-Enhanced Pasture Fertility Program**. The program provides a broader spectrum of key nutrients than a typical dry NPK application and has been shown to have residual benefits in yield, stress tolerance and forage quality in sub-sequent grazing or hay harvests.

Pasture utilization in a **fall lambing system** may include flushing ewes on early spring grass, gestating on summer pasture, lambing on good quality pasture in the late summer or early fall, if available, and lactating on high quality stock-piled forage in mid to late fall. As in spring lambing, an early foliar to correct the potential issues in early spring grass is recommended. In this system, the challenge with summer pasture is often more quantity than quality.

Pasture Management for Sheep in Ohio

Until late in gestation, the ewe flock doesn't need top quality feed; however, well-fed grass produces more and handles periods of heat and dry weather better than poorly fertilized pasture. If your set-up allows, it may be beneficial to limit access to high quality pasture during early and mid-gestation in order to make a cutting or two of high RFQ hay to be fed to the lactating ewes later in the fall. Unimproved pasture or other lower quality feed can be utilized until the last trimester. To grow adequate late summer and fall pasture, it is usually imperative to make the most of every rain event after the summer solstice. We have found that applying a foliar, such as our FSM Bio-Enhanced Summer Pasture Program, a few days after grazing or hay harvest prepares the plant to grow whenever the next rain event happens. Unfed grass greens-up when it rains but often doesn't grow much.

Several years ago, our area had the typical summer pattern of a thunderstorm putting down a half to an inch and a half of rain once every two to three weeks. Most of the lawns, pastures and grass hay field went dormant after a week of no rain and only greened-up after a nice rain. Our foliar-fed pastures and hay fields both stayed green and growing longer after a rain and started putting on growth immediately after a rain event.

Since the most important time to have adequate high-quality forage for the flock is late summer through the fall, its important from a planning perspective to have enough options in case the weather throws you a curve. If adequate fencing can be arranged, grazing the last cutting off mixed grass-legume hay fields or summer planted annual forage can be excellent options for ewes ready to lamb or lactating.

Many of the same principles apply to a winter lambing system; even though, the flock is being maintained on grass, only having elevated nutritional needs during flushing and late gestation. Vigorous, well mineralized pasture helps ewes to rebuild body reserves lost during lactation and is generally a less expensive, less labor intense way to carry the flock through the sum-mer.

Setting aside a paddock or two for flushing or planting a summer annual for that purpose and stock-piling a last hay cutting or grazing paddock are generally the only elevated needs where pasture can be utilized in this system. The primary forage focus in this system is making adequate high-quality stored feed since the primary elevated nutritional need occurs during the winter months.

From my perspective, a farm can never have too much high-quality forage. The utilization of that forage may vary according to the system used but adapting a system to fit your ability to produce forage is generally more profitable than having to obtain forage for a system that doesn't fit your ability to produce it.

Electric Power Fence Energizers - Suitable for all species of livestock, Gallagher offers 110volt energizers for every farm! From the **M10**, powering up to 2 miles of fencing with .1 stored joules of energy, to the **M10000i**, which powers up to 6,000 acres with 100 stored joules of energy, we offer a Gallagher Energizer for every size operation and budget! Each electric energizer has built -in lightening protection, performance indicator lights, and Radio Frequency Interference suppressed circuitry to reduce noise on radio's and tv's. Energizers have a 30-day satisfaction guarantee and a 2-year warranty!

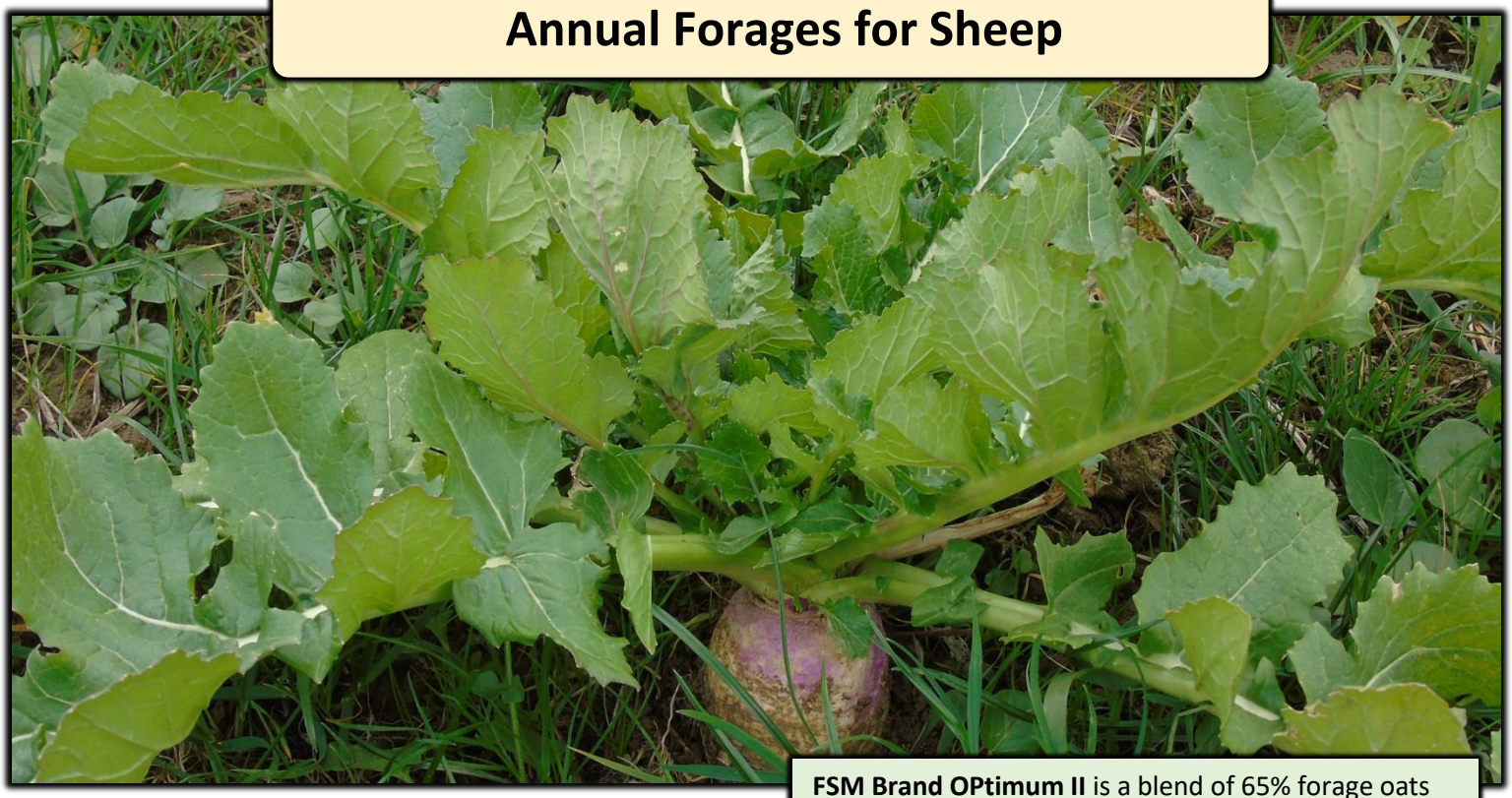
Smart Fence - Is a portable, 4 strand "instant fence" that is easy to move and set up! The package includes ten posts, the wire and reel. Great for more efficient rotational or "mob" grazing or grazing non-fenced areas. Smart Fence has a 1-year warranty.

Learn how to properly fence your pasture for long-term animal control, request the Fence Configuration Guide!

"Smart Fix" Fence Volt/Current Meter and Fault Finder - This handy pocket-sized tool remains a favorite here on the Fowler Farm! The Smart Fix not only indicates the voltage on hot or ground wires, but also saves you time by showing the direction and magnitude of electrical flow leading you directly to faults both small and large! Product comes with a 1-year warranty and 3 year long-life replaceable battery.

Energy-free Watering Systems - Miraco perfected energy-free watering systems and was the first to manufacture automatic livestock waterers from poly materials. These products have no sharp edges, are made from impact resistant polyethylene, resist corrosion, do not chip or crack and have a sloped bottom for easy cleaning. Best of all, they are cost-effective and are backed by a 5-year warranty! Be sure to check out their non-electric, frost-free products for use in the barn, pasture, or feedlot.

Annual Forages for Sheep



In any system, annual forages should be used to fill any real or potential gaps between pasture and hay production, either in quantity, quality, or timeliness of forage.

The advantage of an annual forage is a higher yield in a shorter time than perennial forages. The disadvantage is the higher cost of production. In this article, we will examine how spring, summer and fall planted annuals can fit into each of the various sheep production systems previously identified.

Spring planted annual forages are primarily variations of forage oats, spring triticale and/or forage peas. FSM Brand **OPTimum II** forage mix is a 60/40 blend of FSM Brand Banquet late maturing forage oats and FSM Brand Packer forage peas. **Trical Brand Flex 719** can also be planted for spring forage production.

While all of these products have the potential to produce above average quality forage, they are primarily used in sheep production either as grazing or low-moisture bailage during maintenance and early or mid-gestation when nutritional requirements are not as high.

These forages can be planted in spring as soon as fields are fit or in summer after small grain harvest, alone or in combination with a brassica. They are typically ready to graze 45-50 days after germination or to harvest as bailage at about 55-60 days. There will be less waste with sheep if harvested or grazed at a less mature stage.

FSM Brand OPtimum II is a blend of 65% forage oats and 35% forage peas designed to maximize quality and tonnage, especially for dairy. Both are great as a nurse crop for alfalfa, as high yielding bailage or as a soil building cover. Protein levels of 15-20% with dry mater digestibility approaching 70% should be expected when harvested in a timely manner about 60 days after planting in spring or late summer. Plant in late July or August for top quality fall harvest.

FSM Brand Banquet Forage Oats offers quick establishment, excellent standability and superior yields. The forage quality exceeds that of other industry favorites with the 30-hour NDFd exceeding 74%!

Banquet also demonstrated surprising levels of heat tolerance and very good rust resistance in a recent Pennsylvania trial, with relative feed quality surpassing Everleaf 126 and Jerry by 10-15 points!

Trical Brand Flex 719 Triticale -
Moderate plant height, good straw strength, good early seedling vigor, high silage yield and good silage quality. 32% higher yield than Trical 815.

Dessie's Summer Lovegrass (TEFF) -
Excels in summer heat with adequate moisture. Up to 3 tons of soft-leafed, dry hay in just 6 weeks!

Aroostook Rye is extremely hardy with superior fall forage production! Shepherds desiring an annual winter forage between crops can establish Aroostook or fall triticale after corn silage and soybeans or by seeding into these with an airplane.

For maximum quality and nitrogen production, we recommend including hairy vetch with rye or triticale.

Annual Forages for Sheep

Despite the name, **Cow Candy II BMR** sorghum-sudan is our flagship summer annual for sheep production. Planted alone or with turnips or forage rape, it can fill any grazing gaps from mid-July through frost or provide high yields of energy-rich, palatable winter feed. BMR can be planted any time after soils reach 65 degrees (Memorial Day) through mid-July. For sheep production, we recommend grazing or mechanical harvest at 3 to 4 feet of growth.

Teff (Dessie's Summer Lovegrass or Moxie) is an alternate summer annual that can be grazed or dry baled. Teff also should be planted in warm soils. Except on extremely fertile ground, forage quality is low to moderate for sheep production. It makes an excellent maintenance and early gestation forage.

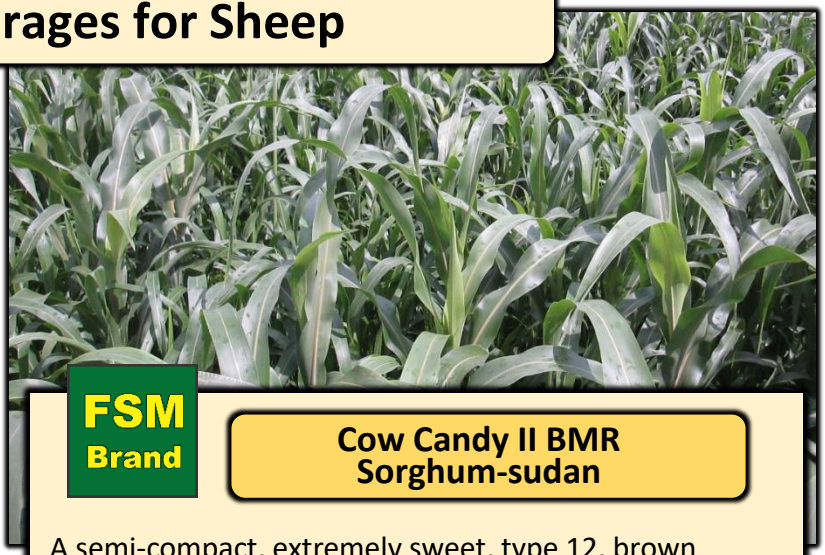
Forage brassicas **(Barkant turnip or T-Raptor hybrid rape)** are highly digestible, high energy and high protein. Brassicas like other vegetable crops can be planted from spring through early fall; however, insect pressure can severely damage new seedings before July. While sheep can handle grazing straight brassicas, we recommend blending them with **Cow Candy II, OPTimum II** or other source of fiber to slow down the rate of passage and reduce fecal wool staining.

Fall planted annuals, like **Aroostook rye or Trical Flex 719** triticale can be grazed from late fall through winter when snow cover allows or harvested as stored feed in the late spring. These fit in the same nutritional windows as forage oats--maintenance and early to mid-gestation. Fall annuals can be interseeded in crop residues or after soybeans or silage. Any of these annual products can be enhanced in yield and quality by applying an **FSM Bio-Enhanced Small Grain Program.**

Planting a few acres of annual forage is a good hedge against weather related forage shortages and works as renovation tool for worn out hay or pasture fields.

Barkant Turnip - is a high-yielding diploid variety, with good resistance to bolting and very good disease resistance. The high sugar content provides winter hardiness and improved palatability. Production of up to 4-6 tons/acre of dry matter under good grazing management is common. Matures in 60-90 days.

T-Raptor Rape - a hybrid, bulbless brassica with large, succulent leaves and stems. T-Raptor has superior palatability to other brassicas with high energy and protein content. Reaches maturity in 45-50 days.



FSM Brand

Cow Candy II BMR Sorghum-sudan

A semi-compact, extremely sweet, type 12, brown midrib sorghum-sudan hybrid that produces excellent yields of highly digestible, high energy summer forage.

Maturity: 92 days from sowing (heading); cut or graze forage at 45-60 days

Height: 5'-7'tall, excellent standability

Regrowth: Extremely rapid, profuse tillering, non-photo sensitive

Forage Yield: 18-25 tons @ 65% moisture (1 ton dry matter per foot)

Forage Quality: Type 12

FSM Brand Cow Candy II BMR offers superior forage digestibility, drought and disease tolerance, excellent standability and very high leaf retention at harvest!

Protein levels of 15-20% are common with dry matter digestibility exceeding 75%.

FSM Bio-Enhanced Small Grain Program

Spring Green-up or Starter Application

MVP*	2 gallon/acre
Starter Blend or PKT 18*	4 gallon/acre
Dramm ONE fish*	2 gallon/acre

Fall Starter Application

MVP*	1 gallon/acre
Starter Blend or PKT 18*	3 gallon/acre
Dramm ONE fish*	1 gallon/acre

*Products generally acceptable for organic production

Hay Production for Sheep

In the previous articles, we have identified the periods of time in each system where higher quality forages are required and the windows of need potentially filled by pasture and annual forages. In each of the lambing systems discussed, there are appropriate times to feed low, medium, and high-quality hay. The goal of hay production for sheep should be to produce an appropriate balance of protein, energy, and minerals to meets the flock's nutritional requirements.

Lactating ewes and growing lambs have the highest protein and energy requirements of any class of sheep. As a general principle, legumes are good sources of protein but have less digestible energy than well-made grasses. Therefore, a well-made hay that is approximately 50 percent legume and 50 percent non-headed grass is ideal to meet these high requirements.

As previously discussed, late gestation ewes and ewes during flushing have lower protein requirements but still require energy dense forage. A well-made grass hay with a low percentage of legume generally works during this stage. During maintenance and early to midgestational is the time to feed lesser quality hay as needed.

Sheep do well on dry hay and well-sealed sweet hay. We have seen an occasional problem with Listeriosis in silage bales; therefore, they are not recommended for sheep except in a pinch.

Grasses have a very wide range of feed value depending on genetics, fertilization, and maturity at harvest. Most cool season grass varieties released in the last 25 years have been selected for leaf production and fiber digestibility as well as yield making them preferable for quality hay production. Older varieties, while less expensive, tend to head early resulting in an extremely short window for quality harvest.

As a longtime distributor for **Barenbrug** (the world's largest grass seed company), Fowler Seed Marketing has access to the best genetics for agronomics, yield, and quality. For these varieties to reach their genetic potential for yield and forage quality, providing balanced nutrition to the plant is essential. A typical dry NPK fertilizer supplies a large amount of a few nutrients often creating nutrient imbalance in the plant. Our **FSM Bio-Enhanced Mixed Hay Program** has been shown to increase season long yield and increase forage quality up to 50 points of RFQ compared to a check strip.

This program contains a broad spectrum of nutrients and beneficial microbes that work together to enable products like **FSM Brand HQ-W, HQ-P** and **Barenbrug E2-631** to reach their genetic potential.

Growing high-quality hay is one thing. Getting it harvested at the proper time is sometimes another. On our farm, we typically wrap first cutting and any other cuttings where the weather doesn't cooperate so that we can maximize the quality of our harvested forage. By planting improved grass and legume varieties, providing them with balanced fertilization and harvesting at the appropriate stage of maturity, producers give themselves the best chance of producing quality hay for the sheep flock.

FSM Bio-Enhanced Mixed Hay Fertility Program

Early Spring Application Greenup

MVP*	2 gallon/acre
Starter Blend or PKT 18*	4 gallon/acre
Magnesium Sulfate*	1-2 pounds/acre
Residuce WS	1/10th lb/acre

Late Spring/Early Summer Application

MVP*	1 gallon/acre
Forage Boost or Premium Blend 18*	4 gallon/acre
Magnesium Sulfate*	2 lbs/acre

Late Summer/Early Fall Application

MVP	1 gallon/acre
Premium Blend 18*	4 gallon/acre
K Sulfate Solution*	4 gallon/acre

* Products generally acceptable for organic

The goal of hay production for sheep should be to produce an appropriate balance of protein, energy, and minerals to meets the flock's nutritional

FSM Brand 414-BR offers outstanding disease and pest resistance! It's branch root characteristic improves resistance to excessive moisture, freezing and thawing, while producing high quality forage with excellent yields. 414-BR is very persistent, has quick cutting recovery, producing in late fall with good winter hardiness.

FSM Brand 514-ML - A synthetic alfalfa offering fast recovery, high multifoliate expression, stand persistence and a good disease package to deliver high quality hay on an aggressive cutting schedule.

BARENBRUG E2-631 Blend

Developed for optimum quality and yield! Yields of E2-631 are nearly double when compared to alfalfa alone, while the grass components significantly increase the digestible energy of the forage, winter hardiness, and stand longevity.

FSM Brand Snowbelt Orchardgrass is a high yielding, disease resistant, soft-leafed, late maturing variety that adds drought tolerance, flexibility, and durability to pastures for any species of livestock on a range of soils and conditions. Snowbelt offers season-long yields, excellent winter hardiness, and leaf disease resistance, establishing more thickly and quickly than other varieties.

FSM Brand HQ-P Hay Blend

FSM Brand HQ-P Hay Blend combines densely-rooted grasses with moisture tolerant legumes to accomplish the dual goals of reducing sediment and nutrient run-off and productive, quality hay. **Components include:**

Soft-leafed endophyte-free tall fescue offering maximum tonnage potential of highly palatable forage;

Late maturing timothy strongly enhances first cutting yield while extending the optimal harvest window.

Italian ryegrass, key for quick establishment, **erosion** prevention, weed-suppression and initial yield;

Birdsfoot trefoil, a legume that thrives in soils too wet for alfalfa. With adequate nutrients, it will contribute yield and protein to hay produced on these soils;

Freedom red clover A low pubescence variety known to last 3 years without reseeding. It's the best choice for hay on poorly drained soils with minimal dust/mold issues.

HRL Orchardgrass – stands for **"High Leaf Ration Blend"** and is a very productive, soft-textured, late maturing blend that offers a longer harvest window for making quality hay.

Maturing about the fourth week of May, **HLR** includes **Intensiv**, known for its superior palatability, high digestibility, and yield. HLR is a good companion for alfalfa and is very winter hardy, tolerant of rust and resistant to other leaf diseases.

Kevin Fowler received his BS in Agriculture, majoring in Animal Science, in 1986 and his MS in Agricultural Economics in 1989 from The Ohio State University (OSU). His master's thesis "An Initial Inquiry into the Circumstances Affecting Profitability Among Modern Cow-Calf Enterprises in Southeastern Ohio" co-authored with Dr. Thomas Stout became one of the seminal works in the various 'improved grass' and 'grazing' initiatives of the OSU Extension and the Natural Resource Conservation Service (NRCS).

After several years in the seed, fertilizer and feed industry, Kevin and his wife, Laura, started Fowler Seed Marketing, a business devoted to bringing the best available forage products to clients in and around Ohio. Along the way, their understanding of soil fertility and plant nutrition developed through relationship with Agri-Energy Resources (now AgriEnergy Solutions) of Princeton, IL, a company devoted to improving the nutritional value of food and feed crops using biological tools and methods.

Kevin & Laura, both grew up around livestock. Together with their seven children, they have direct marketed freezer beef, lamb, pork and farm-fresh eggs since the mid-1990's. By using the products, they sell, they've gained valuable insight into the benefits and challenges of new products and methods. Both have over 40 years of shepherding experience working with several different systems and forage management schemes.

Today, Kevin serves as Vice President of Sales & Marketing for Fowler Seed Marketing which provides marketing and consulting support as well as high-quality forage products and fertility programs to maximize their genetic potential for a network of clients and dealers in and around Ohio.

Quick Reference Seeding Rate Chart

FSM Brand Products	Description	Seeding Rate per Acre
HQ-F Pasture Mix	Pasture mix for all species of livestock, all soil types.	35-40# (10-20#, overseeding)
HQ-O Pasture Mix	Grassy hay or pasture, lighter soils.	35-40# (10-20#, overseeding)
HQ-R Pasture Mix	Beef or dairy cattle, soils with 3% or more organic matter.	35-40# (10-20#, overseeding)
Early Riser Timothy	Early maturing, leafy and persistent! Higher yields!	8-10# (4-6#, mixture)
Sleepyhead Timothy	Late maturing, very leafty, excellent winterhardiness!	8-10# (4-6#, mixture)
Mary Meadow Fescue	Soft, highly palatable bunch grass, excellent digestibility.	30-35# (20-25# haylage)
Snowbelt Orchardgrass	High yielding, winter hardy, disease resistant, drought tolerant.	25# pasture (10-12# dry hay)
414-BR Alfalfa	Branch-rooted, improved forage quality, excellent disease resistance.	15-18# (10-12#, mixture)
417-ML Alfalfa	High yielding, higher leaf/stem ratio, great disease package.	15-18# (10-12#, mixture)
514-ML Alfalfa	High yields of high quality, disease resistant alfalfa.	15-18# (10-12#, mixture)
HQ-P Hay Blend	High quality grass/legume hay blend for poorly drained soils.	30-35#
HQ-W Hay Blend	High quality alfalfa/grass hay blend for moderate - well drained soil.	30-35#
Wildcat Red Clover	Persistent, high yielding and disease resistant.	8-10# (4-6#, mix, overseeding)
Reddy Red Clover	Short-term variety. Quick to establish, very good yields.	8-10# (4-6#, mix, overseeding)
Cow Candy II BMR	High yielding, high energy in a compact leafy plant.	35-50#
Silo Candy BMR	Energy dense, short season, one-cut forage.	35-50#
OPTimum II Forage Mix	Forage oat and forage pea blend for high yields and quality.	100-125# (65-80# nurse crop)
Banquet Forage Oats	Leafy forage oat, good heat tolerance and disease resistance.	100# (50-75# nurse crop)
Barenbrug Products		
T-Raptor Rape	Extremely palatable fall and winter forage.	3-5# (2# in mix)
Barkant Turnips	High quality fall and winter grazing, soil conditioning.	3-5# (2# in mix)
Forage Feast Chicory	Pasture diversity, drought tolerance, minerals.	15# (2-3# in mix)
Baron Ky Bluegrass	High yield, tolerant of tight grazing, excellent winter-hardiness.	20# (5# in mix)
HDR Meadow Fescue	High Disease Resistance, tolerates very wet soils, very palatable.	30# 8-12# in mix)
BarOptima+E34	Improved heat & drought tolerance in a soft-leafed fescue.	25# (same with clover)
STF-43 Tall Fescue Blend	Late maturing combination great for hay.	20-25# for hay
Bariane Tall Fescue	Late maturing, great for hay or pasture.	20-25# for hay; 30# pasture
E^2-640 / $E^2$631	Hybrid alfalfa / grass mixtures, yellow jacket coated.	25# for hay
Milkway	Highly digestible blend of soft leaf tall fescue & meadow fescue.	30# (8-15# in mix)
HLR Orchardgrass	High Leaf Ratio, heads 4th week of May, high yields, palatable.	10-12# (4-6# in mix)
Hercules Annual Ryegrass	Fast establishing forage or cover crop.	40# forage; 20# cover
Green Spirit/Green Gold Italian Ryegrass	Fast establishing, no heads in seeding year.	40# forage; 20# cover
Barsprinter/BG-34 PRG	Extremely dense, persistent; pasture on 3%+ org. matter.	30# (10-25# mix)
Remington PRG	Extremely dense, tetraploid; grazing or mechanical harvest.	30# (10-25# mix)
Remington NEA2 PRG	Friendly-endophyte; improved heat/drought/cold tolerance.	30# (10-25# mix)
Tenho Timothy	Rapid establishment, very leafy, persistent and winter-hardy.	10# (4-6# mix)
Freedom Red Clover	Less hairs on stem for faster drying, less dust, great for hay!	15# (4-8# mix, 4# over)
Alice/Regalgraze White Clover	Nitrogen fixing, pasture and cover in produce.	10# cover; 2-3# mix
Other Seed Products		
Barley	Winter, **Thoroughbred**; Spring, **Robust** (when available).	100-120#
Buckwheat	**Mancan** or VNS, plant June for grain, cover crop or honey.	40-60#
Oats	**Armor, Burton, Corral**; **Banquet** and **Feast organic** forage oats.	100-120#
Spelt	**Champ, Oberkulmer, Maverick, Comet, Sungold**	110-150#
Austrian Winter Peas	Winter hardy, nitrogen-fixing forage or cover crop.	60# (40-50#, rye, oats)
Forage Peas	**Packer** & **N-Pea,** nitrogen fixing forage and cover crop.	50# (30# mix)
Birdsfoot Trefoil	**Leo**, legume for poor ground.	12# (4-6# mix)
Organic Hairy Vetch	VNS & **Purple Bounty,** high protein, nitrogen-fixing cover crop.	30# (15-25# with rye)
Aroostook Rye / Fall Triticale	Very leafy, superior fall forages or cover.	100-120# (same, vetch)
Dessie's Summer Lovegrass (TEFF)	Summer annual that can be dry baled, cover crop.	5-6# (uncoated seed)
Reed Canary Grass	**Rival,** low alkaloid, wet areas, buffers.	20# (6-8# mix)