

3 YEAR RESULTS FROM 2007 through 2009
Summary of Seeding Mixtures and Establishment Techniques
MODOT Site's 1, 2, and 3 located in Van Buren Missouri.

Site 1 - Utilization of Erosion Blanket,
Standard Fertility
NRCS Warm Season Critical Area Seeding Mixture

Table 1 is standard fertilizer and lime effects on plant density of NRCS critical area warm season seeding mixture with the application of erosion Control blanket, Van Buren MO.

Species	Site 1			
	2007	2008	2009	3 year Average
Grass	-----plant/m ²			plant/m ²
switchgrass	2.0 a ¹	7.7 a	5.4 a	5.0 a
little bluestem	1.3 b	1.5 b	1.9 b	1.5 b
Indiangrass	0.6 c	0.7 c	2.7 b	1.4 b
broomsedge bluestem	0.5 c	0 d	0.0 c	0.0 c
tall dropseed	0.1 c	0 cd	0.0 c	0.0 c
Canada wildrye	0 c	0.1 d	0.1 c	0.0 c
oats	0 c	0 d	0 c	0.2 c
Legume				
annual lespedeza	0 c	0.1 cd	0.0 c	0.0 c

1 – Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

The evaluations conducted in 2009 illustrated in the above table a significant trend of switchgrass being the dominant species on site. Indiangrass increased in 2009 as the next prevalent species followed by little bluestem. The switchgrass density for plants/meter² is higher with this seeding mixture compared to the MODOT seeding mixture in table 2.

The site had an average between the reps of 30% rill erosion on site after the fall of 2009 which accounts for the better establishment of vegetation using erosion blanket.

Summary 3 Year Average for Site 1 Table 1 Mixture and Treatment.

For Site 1 this seeding mixture has the highest stand of switchgrass 5.0 plant/m². Switchgrass provided the most cover in the first year and still the dominant species in the 3rd year. Little bluestem and indiangrass are increasing in the vegetation by the 3rd year. Perennial grass species account for 7.9 plant/m² which is adequate plant cover along with the erosion control blanket. This erosion blanket treatment is the best control for least amount of erosion on this site.

**Site 1 – Utilization of Erosion Blanket,
Standard Fertility
MODOT Warm Season Seeding Mixture**

Table 2 is standard fertilizer and lime effects on plant density of MODOT warm season seeding mixture with the application erosion control Blanket, Van Buren MO.

Species	Site 1			
	2007	2008	2009	3 year Average
Grass	----plant/m ²			Plant/m ²
switchgrass	1.9 a ¹	5.7 a	4.3 a	4.1 a
little bluestem	1.3 ab	1.9 b	1.0 cde	1.4 bc
Indiangrass	1.0 b	1.3 bc	3.3 ab	1.9 b
big bluestem	0.2 c	0 d	0.3 de	0.1 e
tall dropseed	0 c	0.04 d	0.0 e	0.0 e
sideoats grama	0 c	0.6 cd	2.4 bc	0.7 cd
Canada wildrye	0.1 c	0 d	0.0 e	0.1 e
perennial ryegrass	0.04 c	0 d	0 e	0.0 e
annual rye	0 c	0 d	0 e	0.0 e
redtop	0 c	0 d	0 e	0.0 e
red fescue	0 c	0 d	0 e	0.0 e
oats	0 c	0 d	0 e	0.0 e
Legume				
white clover	0 c	2.0 b	0.0 e	0.7 cd
partridge pea	0.2 c	0.7 cd	1.7 bcd	0.8 cd
purple prairie clover	0 c	0 d	0 e	0.0 e
Forbs				
gray headed coneflower	0 c	0 d	0 e	0.0 e
black-eyed susan	0 c	0 d	0 e	0.0 e

1 – Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

The evaluations conducted in 2009 illustrates a slight decrease from 2008 with switchgrass, but still being the dominant species on site. Little bluestem and indiagrass is significant less than switchgrass; however indiagrass is increasing on this site with more plant/m² than little bluestem.

The legume species of white clover in 2009 did not persist on the site. Partridge pea has doubled in the amount of plant/m² since 2008, now being the only legume species on site.

The site had an average between the reps of only 30% rill erosion on site after the fall of 2009 which accounts for the better establishment of vegetation using erosion blanket.

Summary 3 Year Average for Site 1 Table 2 Mixture and Treatment.

For Site 1 this seeding mixture has the highest perennial grass species. Warm season grasses dominant the stand, 8.3 plant/meter², which is adequate plant cover. This mixture should eliminate all cool season grass species, perennial and annual species, because they do not establish on these sites. Switchgrass, 4.1 plant/m², was the dominant species for the 3 year average. Indiangrass, little bluestem, sideoats grama is providing increasing vegetation by the 3rd year.

Legumes can provide benefit to these sites for fixing nitrogen for the perennial grasses. White clover was establishing the 2nd year but did not persist into the 3rd year. Partridge pea increased each year on the site and was the only legume persisting on this site. Other legumes and forbs in this mixture did not establish.

The erosion blanket treatment is the best control for least amount of erosion on this site.

**Site 1 –Utilization of Fiber Mulch,
Standard Fertility
NRCS Warm Season Critical Area Seeding Mixture**

Table 3 is standard fertilizer and lime effects on plant density of NRCS critical area warm season seeding mixture with the application of fiber mulch for erosion control, Van Buren, MO.

Species	Site 1			
	2007	2008	2009	3 year Average
Grass	-----plant/m ² -----			plant/m ² -----
switchgrass	1.9 a ¹	2.9 a	3.5 a	2.8 a
little bluestem	1.5 a	0.7 b	1.4 b	1.2 b
Indiangrass	0.4 b	0.4 b	1.7 b	0.8 b
broomsedge bluestem	0.0 b	0.0 b	0.0 c	0.0 c
tall dropseed	0.1 b	0.0 b	0.0 c	0.0 c
Canada wildrye	0.1 b	0.0 b	0.0 c	0.0 c
oats	0.1 b	0.0 b	0.0 c	0.0 c
Legume				
annual lespedeza	0.0 b	0.6 b	0.0 c	0.2 c

1 – Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

The evaluations conducted in 2009 illustrates a significant trend of switchgrass being the dominant species on site.

The switchgrass density is about double for plants/meter² with this seeding mixture compared to the MODOT seeding mixture in table 4.

Little bluestem and indiagrass are the next prevalent species, with an increase in 2009 especially with indiagrass; but significant less than switchgrass.

In the fall of 2009 the average between the reps was 70% rill erosion on site. This erosion accounts for the lack of established vegetation, compared to average 30% for the erosion blankets.

Summary 3 Year Average for Site 1 Table 3 Mixture and Treatment.

For Site 1 switchgrass provided the most cover in the first year and still the dominant species in the 3rd year. Little bluestem and indiagrass did provide increased vegetation by the 3rd year. Perennial grass species account for 4.8 plant/m² which is not adequate plant cover.

This fiber mulch treatment did not provide erosion control, 70% rill and gully erosion on this site.

**Site 1 - Utilization of Fiber Mulch,
Standard Fertility
MODOT Warm Season Seeding Mixture**

Table 4 is standard fertilizer and lime effects on plant density of MODOT warm season seeding mixture with application of fiber mulch for erosion Control, Van Buren MO.

Species	Site 1			
	2007	2008	2009	3 year Average
Grass	-----plant/m ² -----			Plant/m ²
switchgrass	0.9 ab ¹	1.4 b	2.1 ab	1.4 b
little bluestem	0.5 bcd	0.5 b	1.2 bc	0.7 bc
Indiangrass	0.5 bcd	0.4 b	2.8 a	1.2 b
big bluestem	0.1 d	0.1 b	0.1 c	0.1 c
tall dropseed	0.0 d	0.0 b	0.0 c	0.0 c
sideoats grama	0.2 cd	1.1 b	2.0 ab	1.1 b
Canada wildrye	0.0 d	0.0 b	0.0 c	0.0 c
perennial ryegrass	0.8 abc	0.2 b	0.0 c	0.3 c
annual rye	0.2 cd	0.0 b	0.0 c	0.1 c
redtop	0.0 d	0.0 b	0.3 c	0.1 c
red fescue	0.0 d	0.0 b	0.2 c	0.1 c
oats	0.0 d	0.0 b	0.0 c	0.0 c
Legume				
white clover	1.2 a	4.8 a	1.1 bc	2.3 a
partridge pea	0.1 cd	0.3 b	1.7 ab	0.7 bc
purple prairie clover	0.0 d	0.0 b	0.0 c	0.0 c
Forbs				
gray headed coneflower	0.0 d	0.0 b	0.0 c	0.0 c
black-eyed susan	0.0 d	0.0 b	0.0 c	0.0 c

1 – Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

The evaluations conducted in 2009, an increase indiangrass, followed by switchgrass, sideoats grama, and little bluestem.

The legume white clover is decreasing in persistence. Partridge pea did increase by the 3rd year, probably do to the hard seed coat breaking down and plants developing more plants this 3rd year.

The rill erosion percentage rating has been increasing during 2009 in the fiber mulch treatment, regardless of the species planted on Site 1.

In the fall of 2009 the average between the reps was 70% erosion on site, which accounts for the lack of established vegetation, compared to an average of 30% for the erosion blankets.

Above annual rainfall again in 2009 and the loss of the fiber mulch since seeding illustrates the need for plant species to establish quickly.

Erosion blankets are needed for adequate site protection for vegetation to become established to control erosion.

Summary 3 Year Average for Site 1 Table 4 Mixture and Treatment.

Warm season grasses dominant the stand, 4.5 plant/meter², however not adequate perennial cover for this site. This mixture should eliminate all cool season grass species, perennial and annual species, because they did not persist significantly on this site.

Switchgrass provided the most cover in the first year and still the dominant species in the 3rd year with an average of 1.4 plant/ meter² Indiangrass, little bluestem, sideoats grama is providing increasing vegetation by the 3rd year.

Legumes can provide benefit to these sites for fixing nitrogen for the perennial grasses. White clover was establishing the first year and succeeding years, with a decrease in 2009, it did maintain on site, 2.3 plant/meter² for the 3 year average. Partridge pea increased each year on the site and was the dominate legume by the 3rd year average of 3.0 plant/meter². Other legumes and forbs in this mixture did not establish.

This fiber mulch treatment did not provide erosion control, 70% rill and gully erosion on this site.

**Site 2 – Utilization of Erosion Blanket,
Recommended Soil Test Fertility
NRCS Warm Season Critical Area Seeding Mixture**

Table 5 is recommended fertilizer and lime effects on plant density for NRCS critical area warm season seeding mixture with application of erosion blanket. (Fertilizer applied at planting only).

Species	Site 2			
	2007	2008	2009	3 year Average
Grass		plant/m ²		plant/m ²
switchgrass	1.8 a ¹	5.4 a	3.6 a	3.6 a
little bluestem	1.1 b	1.8 b	1.9 b	1.6 b
Indiangrass	0.5 c	0.4 c	0.8 c	0.6 c
broomsedge bluestem	0.0 c	0.0 c	0.0 d	0.0 d
tall dropseed	0.1 c	0.0 c	0.0 d	0.0 d
Canada wildrye	0.2 c	0.0 c	0.0 d	0.1 d
oats	0.0 c	0.0 c	0.0 d	0.0 d
Legume				
annual lespedeza	0.0 c	0.2 c	0.5 cd	0.2 cd

1 – Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

Switchgrass is the dominant species with a decrease in plant/meter² followed by little bluestem an increase with indiagrass in 2009. The other warm season grass species did not increase in the two years. This site had an average between the reps of 42% rill erosion by the fall of 2009.

Summary 3 Year Average for Site 2 Table 5 Mixture and Treatment.

For Site 2 switchgrass provided the most cover in the first year and still the dominant species in the 3rd year at 3.6 plant/m². The switchgrass shows a decrease in the 3 year average in plants/m² over the standard fertility in site 1 table 1. Little bluestem and Indiangrass did increase in vegetation by the 3rd year. The additional fertility did not show an increase in plant/m² for the warm season species that developed on this site.

Perennial warm season grass species account for 5.8 plant/m² which is marginal plant cover. Erosion was higher 42% average on this site for the three years.

**Site 2 – Utilization of Erosion Blanket,
Recommended Soil Test Fertility
MODOT Warm Season Seeding Mixture**

Table 6 recommended fertilizer and lime effects on plant density of MODOT warm season seeding mixture with erosion blanket for erosion control, Van Buren, MO. (fertilizer applied at planting only).

Species	Site 2			
	2007	2008	2009	3 year Average
Grass		--plant/m ² --		plant/m ²
switchgrass	0.6 b ¹	3.8 a	3.5 a	2.6 a
little bluestem	0.9 ab	1.6 bc	2.0 b	1.5 b
Indiangrass	0.2 b	2.2 b	2.2 b	1.5 b
big bluestem	0.0 b	0.1 d	0.0 c	0.0 c
tall dropseed	0.0 b	0.0 d	0.0 c	0.0 c
sideoats grama	0.1 b	0.1 d	0.0 c	0.1 c
Canada wildrye	0.0 b	0.0 d	0.0 c	0.0 c
perennial ryegrass	1.7 a	0.0 d	0.0 c	0.0 c
annual rye	0.0 b	0.0 d	0.0 c	0.0 c
redtop	0.0 b	0.0 d	0.0 c	0.0 c
red fescue	0.0 b	0.0 d	0.0 c	0.0 c
oats	0.0 b	0.0 d	0.0 c	0.0 c
Legume				
white clover	0.4 b	0.0 d	0.0 c	0.1 c
partridge pea	0.2 b	0.9 cd	1.5 b	0.9 bc
purple prairie clover	0.1 b	0.0 d	0.0 c	0.0 c
Forbs				
gray headed coneflower	0.0 b	0.0 d	0.0 c	0.0 c
black-eyed susan	0.0 b	0.0 d	0.0 c	0.0 c

1 – Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

The switchgrass, indiagrass, and little bluestem are comparable with plants/m² in 2009. In comparison to the standard fertility, with the same mixture and erosion treatment in table 1 there was a 3 year average of adequate cover at 7.9 grass species /m² compared to table 6 with marginal cover at 5.7 grass species /m². The other warm and cool season species did not increase.

This site had an average between the reps of 42% rill erosion on site by the fall 2009.

Summary 3 Year Average for Site 2 Table 6 Mixture and Treatment.

For Site 2 the three major grasses that developed were switchgrass, little bluestem and indiagrass.

Switchgrass provided the most cover in the first year and still the dominant species in the 3rd year average of 2.6plant/m². The switchgrass has a decrease in the 3 year average over the standard fertility in site 1 table 2. Little bluestem and Indiagrass did provide increased vegetation by the 3rd year. The additional fertility did not show an increase in plants/m² for the warm season species that developed on this site.

Perennial grass species account for 5.7plant/m² which is marginal plant cover. Table 5 has a 3 year average seeding mixture at (5.9) grass plants/m² comparable to (5.7) grass plants/m² in table 6; however table 5 used only 6 grasses to 11 grasses in table 6. This mixture should eliminate all cool season grass species, perennial and annual species, because they do not establish on these sites.

Erosion was higher 42% average on this site for the three years.

**Site 2 – Utilization of Fiber Mulch,
Recommended Soil Test Fertility
NRCS Warm Season Critical Area Seeding Mixture**

Table 7 is recommended fertilizer and lime effect on plant density
NRCS critical area warm season seeding mixture with application of fiber mulch
for erosion control. Van Buren, MO (fertilizer applied at planting only).

Species	Site 2			
	2007	2008	2009	3 year Average
Grass	-plant/m ²			plant/m ²
switchgrass	1.8 a ¹	5.0 a	2.5 ab	3.1 a
little bluestem	1.1 b	0.9 b	1.5 bc	1.2 b
Indiangrass	0.5 c	0.1 b	0.7 cd	0.4 c
broomsedge bluestem	0.0 c	0.0 b	0.0 d	0.0 d
tall dropseed	0.1 c	0.0 b	0.0 d	0.0 d
Canada wildrye	0.2 c	0.0 b	0.0 d	0.1 d
oats	0.0 c	0.0 b	0.0 d	0.0 d
Legume				
annual lespedeza	0.0 c	0.4 b	1.8 a	0.7 bc

1-Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

Switchgrass ranked high however decreased in 2009 but still the dominant species followed by little bluestem.

The main reason for the decrease is the amount of 85% rill erosion by the fall of 2009.

A slight increase for indianguass, the other warm season grasses species did not increase during the 3rd growing season.

Annual lespedeza increased in 2009 again hard seed that continues to germinate 3 years after planting.

Summary 3 Year Average for Site 2 Table 7 Mixture and Treatment.

For Site 2 switchgrass provided the most cover in the first year and still the dominant species in the 3rd year, average 3.1 plant/m². Little bluestem and Indiangrass did provide increased vegetation by the 3rd year. The warm season perennial grass species account for 4.7plant/m² which is not adequate plant cover. This fiber mulch treatment did not provide erosion control, 85% rill and gully erosion on this site. This erosion is the cause of inadequate vegetation establishment.

**Site 2 – Utilization of Fiber Mulch,
Recommended Soil Test Fertility
MODOT Warm Season Seeding Mixture**

Table 8 is recommended fertilizer and lime effect on plant density of MODOT’s warm season seeding mixture, with application of fiber mulch. (fertilizer applied at planting only). Van Buren MO.

Species	Site 2			
	2007	2008	2009	3 year Average
Grass	-----plant/m ² ----			plant/m ²
switchgrass	1.9 a ¹	1.2 a	1.2 a	1.4 a
little bluestem	1.9 a	0.4 b	0.8 ab	1.0 ab
Indiangrass	0.5 b	0.1 bcd	1.1 ab	0.6 bc
big bluestem	0.1 b	0.0 d	0.0 d	0.0 d
tall dropseed	0.0 b	0.0 d	0.0 d	0.0 d
sideoats grama	0.0 b	0.0 d	0.3 cd	0.2 c
Canada wildrye	0.0 b	0.0 d	0.0 d	0.0 d
perennial ryegrass	0.2 b	0.0 cd	0.0 d	0.0 d
annual rye	0.0 b	0.0 d	0.0 d	0.0 d
redtop	0.1 b	0.0 d	0.0 d	0.0 d
red fescue	0.0 b	0.0 d	0.0 d	0.0 d
oats	0.0 b	0.0 d	0.0 d	0.0 d
Legume				
white clover	0.0 b	0.0 d	0.0 d	0.0 d
partridge pea	0.1 b	0.3 bc	0.7 bc	0.3 c
purple prairie clover	0.0 b	0.0 d	0.0 d	0.0 d
Forbs				
gray headed coneflower	0.0 b	0.0 d	0.0 d	0.0 d
black-eyed susan	0.0 b	0.0 d	0.0 d	0.0 d

1 – Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

The evaluations conducted in 2009 the plant/m² is the same for the stand of switchgrass and the dominant species on site.

Indiangrass is the next prevalent species with an increase in 2009; and is comparable to the switchgrass. Little bluestem in this mixture is showing an increase.

This composite mixture is providing even less vegetation over time in the number of plant/meter².The decrease in stand can be explained by the amount of rill erosion with the

fiber mulch. The site had an average between the reps of 85% rill erosion on the site by the fall of 2009, similar to site 1 table 4 with the fiber mulch treatment.

Summary 3 Year Average for Site 2 Table 8 Mixture and Treatment.

Site 2 warm season grasses are the components of the vegetation cover, 3.2 plant/meter², however inadequate perennial vegetation is on this site. This mixture should eliminate all cool season grass species, perennial and annual species, because they did not establish on this site.

Switchgrass provided the most cover in the first year and still the dominant species in the 3rd year with an average of 1.4 plant/ meter². Indiangrass, little bluestem, sideoats grama did increase the vegetation on the site to the 3.2plant/m² by the 3rd year.

Partridge pea increased each year on the site and was the only established legume by the 3rd year. Other legumes and forbs in this mixture did not establish.

The additional fertility did not show an increase in plant/m² for the warm season or legumes species that developed on this site.

This fiber mulch treatment did not provide erosion control, 85% rill and gully erosion on this site, which is the main reason for inadequate vegetation on this site.

**Site 3
Utilization of Erosion Blanket
Standard Fertility
MODOT Cool Season Mixture.**

Table 9 is standard fertilizer and lime effects on plant density of MODOT cool season seeding mixture with application of erosion control Blanket. Van Buren, MO. (fertilizer applied at planting only).

Species	Site 3			
	2007	2008	2009	3 year Average
Grass	-----plant/m ² -			plant/m ²
tall fescue	0.5 a ¹	0.1 b	0.2 a	0.3 b
perennial ryegrass	0.3 ab	0.0 b	0.0 a	0.1 b
annual rye	0.0 b	0.0 b	0.0 a	0.0 b
oats	0.0 b	0.0 b	0.0 a	0.0 b
Legume				
white clover	0.1 ab	1.5 a	0.3 a	0.7 a

1 – Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

For 2009 the white clover decreased and tall fescue slight increase in the stand.

This site had an average between the reps of 40% rill erosion by the fall of 2009.

Summary 3 Year Average for Site 3 Table 9 Mixture and Treatment.

Site 3 the cool season grass species did not persist on this site to provide adequate vegetation for this site. The cool season perennial grasses only resulted in 0.4 plant/m².

The white clover was the main species by the 2nd year; however only 1.5 plant/m². In 2009 the white clover reduced in the stand to only 0.3 plant/m².

The erosion blanket did provide erosion control, by the end of 3rd year, 40% rill erosion on site.

The cool season species did not perform with the erosion blankets. The species could have been affected by the heating of the blanks in the summer months after establishment with a desiccation of any growth from this south slope exposure; however rainfall during the year was normal for the establishment year.

**Site 3
Utilization of Erosion Blanket
Recommended Soil Fertility
MODOT Cool Season Mixture.**

Table 10 is illustrate recommended fertilizer and lime effect on plant density of MODOT cool season seeding mixture with an erosion control blanket.
Van Buren, MO. (fertilizer applied at planting only).

Species	Site 3			
	2007	2008	2009	3 year Average
Grass	-	----plant/m ²		plant/m ²
tall fescue	0.3 a ¹	0.0 a	0.0 a	0.1 a
perennial ryegrass	0.8 a	0.0 a	0.0 a	0.0 a
annual rye	0.0 a	0.0 a	0.0 a	0.0 a
oats	0.0 a	0.0 a	0.0 a	0.0 a
Legume				
white clover	0.0 a	0.5 a	0.0 a	0.2 a

1 – Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

White clover was on site the 2nd year however it did not persist by the 3rd year. Tall Fescue did not persist on the site after the 2nd year.

This site had an average between the reps of 40% rill erosion by the fall of 2009.

Summary 3 Year Average for Site 3 Table 10 Mixture and Treatment.

Site 3 the cool season grass species did not persist for adequate vegetation on this site with the additional fertility the establishment year. The cool season perennial grasses only resulted in 0.1 plant/m².

The white clover was the main species by the 2nd year; however only 0.5 plant/m². In 2009 the white clover did not persist in the stand.

The erosion blanket did provide erosion control, by the end of 3rd year only 40% rill erosion.

The cool season species did not perform with the erosion blankets. The species could have been affected by the heating of the blanks in the summer months after establishment with a desiccation of any growth from this south slope exposure; however rainfall during the year was normal for the establishment year.

**Site 3
Utilization of Fiber Mulch
Standard Soil Fertility
MODOT Cool Season Mixture.**

Table 11 is standard fertilizer and lime effect on plant density of MODOT cool season seeding mixture with fiber mulch application for erosion Control. Van Buren, MO (fertilizer applied at planting only).

Species	Site 3			
	2007	2008	2009	3 year Average
Grass	-----plant/m ²			plant/m ²
tall fescue	3.3 a ¹	0.1 b	1.1 ab	1.5 ab
perennial ryegrass	3.7 a	0.0 b	0.5 b	1.4 ab
annual rye	0.0 b	0.0 b	0.3 b	0.1 c
oats	0.0 b	0.0 b	0.0 b	0.0 c
Legume				
white clover	1.7 ab	4.9 a	2.7 a	3.3 a

1 – Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

White clover was the dominant species for 2009, but decreased from 2008. Tall fescue slight increase; however plants were small and not providing adequate erosion control.

This site had an average between the reps of 78% rill erosion by the fall of 2009.

Summary 3 Year Average for Site 3 Table 11 Mixture and Treatment.

Site 3 the cool season perennial grass species did not persist on this site to provide adequate vegetation for this site. The cool season perennial grasses resulted in 2.9 plant/m².

The white clover was the main species by the 2nd year; with 4.9 plant/m². In 2009 the white clover decreased to 2.7 plant/m². The legume species did not provide cover for erosion control the species remained small and development was marginal.

The fiber mulch did not provide erosion control, by the end of 3rd year 78% rill erosion was on this site.

**Site 3
Utilization of Fiber Mulch
Recommended Fertility
MODOT Cool Season Mixture.**

Table 12 is recommended fertilizer and lime effect on plant density of MODOT cool season seeding mixture with fiber mulch application for erosion control. Van Buren, MO. (fertilizer applied at planting only).

Species	Site 3			
	2007	2008	2009	3 year Average
Grass	-	plant/m ² -		plant/m ²
tall fescue	2.3 b ¹	0.5 b	1.0 ab	1.3 b
perennial ryegrass	5.9 a	0.1 b	0.3 b	2.1 a
annual rye	0.0 d	0.0 b	0.3 b	0.1 c
oats	0.0 d	0.0 b	0.0 b	0.0 c
Legume				
white clover	1.2 c	4.7 a	1.9 a	2.6 a

1 – Means WITHIN year column followed by the same letters are not significantly different a P<0.05.

In 2009 white clover was the dominant species. Tall fescue slight increase; however plants were small and not providing adequate erosion control.

This site had an average between the reps of 78% rill erosion by the fall of 2009.

Summary 3 Year Average for Site 3 Table 12 Mixture and Treatment.

Site 3 the cool season grass species did not provide adequate vegetation on this site with the additional fertility the establishment year. The cool season perennial grasses results were 3.4 plant/m² for the 3 year average. The cool season grass species did not persist on this site to provide adequate vegetation for erosion control.

The white clover was the main species by the 2nd year; with 4.7plant/m². In 2009 the white clover did decrease in the stand to 1.9plant/m². The white clover did not provide erosion control the species remained small and development was marginal.

The fiber mulch did not provide erosion control, by the end of 3rd year 78% rill erosion was on this site.

