

# Native Warm-Season Grass Planning Budget

Using this budget, farmers can estimate the costs and returns of establishing native warm-season grass (NWSG) forage species. Table 1 presents estimates for replacing existing forage stands with NWSG in Missouri. Assumptions were based on price forecasts as of September 2023. The NWSG forage species mix used in this budget includes big bluestem, indiangrass, little bluestem and forbs. The mix was assumed to be planted in a dormant season. Multiple calendar years are needed for the NWSG stand to reach full forage yield potential. Seeding mixes are designed to enhance wildlife habitat and meet eligibility for cost share practices. Use the “Your estimate” column to plan your operation’s costs and returns, including any cost share awarded.

**Table 1. Missouri big bluestem, indiangrass, little bluestem and forbs budget for 2024.**

	Year 1 Preparation	Year 2 Establishment	Year 3 Half production	Year 4 Full production	Your estimate
<b>Income</b>	<i>Dollars per acre</i>				
Haying	0.00	0.00	218.75	437.50	
Grazing	0.00	0.00	18.00	36.00	
Total income	0.00	0.00	236.75	473.50	
<b>Operating costs</b>					
Warm-season grass seed	0.00	175.00	0.00	0.00	
Forb/minor species seed mix	0.00	62.50	0.00	0.00	
Fertility <sup>1</sup>	83.40	0.00	31.71	63.42	
Herbicide	20.48	6.00	0.00	0.00	
Custom hire and rental					
Fertilizer application	7.38	0.00	7.38	7.38	
Chemical application	7.50	7.50	0.00	0.00	
No-till drill rental	0.00	21.00	0.00	0.00	
Hay preparation and baling	0.00	0.00	81.67	163.33	
Mowing (rotary cutter)	0.00	25.00	0.00	0.00	
Operator and hired labor	0.00	8.66	0.00	0.00	
Operating interest	5.34	13.75	5.43	10.54	
Total operating costs	124.10	319.41	126.19	244.67	
<b>Ownership costs</b>					
Business overhead & depreciation	0.00	0.00	0.00	0.00	
Real estate charge	9.76	39.04	39.04	39.04	
Total ownership costs	9.76	39.04	39.04	39.04	
Total costs	133.86	358.45	165.23	283.71	
<b>Income over operating costs</b>	<b>-124.10</b>	<b>-319.41</b>	<b>110.56</b>	<b>228.83</b>	
<b>Income over total costs</b>	<b>-133.86</b>	<b>-358.45</b>	<b>71.52</b>	<b>189.79</b>	

Note: Totals may not sum due to rounding.

1. University of Missouri Soil Test Lab recommends 2 pounds of P<sub>2</sub>O<sub>5</sub> and 14.6 pounds of K<sub>2</sub>O per ton of hay yield.

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## Year 1: Fall burndown and seedbed preparation

Year 1 reflects the fall prior to seeding. Seedbed preparation begins in early fall by chemically eradicating the existing stand. Soil tests are taken and fertilizer and lime are applied accordingly. Fertilizer and chemical application are performed by a custom operator. If the existing pastureland is grazed, allocate 75 percent of ownership costs to the previous pasture stand and 25 percent to the new NWSG stand because of lost fall grazing days. If additional pasture must be rented to carry livestock, the cost of renting should be applied to the NWSG.

## Year 2: Seeding and competition management

Year 2 no-till drills the seed and forb mix during the winter dormant season. There will be no forage harvested. Weed control includes an application of Imazapic for broadleaf and cool-season grass control if the label recommends for the seeding mix used. Mowing with a rotary cutter is included for weed and residual grass control. Ownership costs are limited to a land charge.

## Year 3: Fertilization, hay and graze, half mature yield

Forage production begins in Year 3, which is at least one full year after seeding. Yield will be approximately 50 percent of full production. Costs include a nitrogen application to boost yield and plant vigor along with potassium and phosphorous applied according to soil test recommendations and yield goals. If weed pressure is an issue, an application of an approved herbicide can be used or the area can be mowed for broadleaf control.

Yield is measured both in tonnage harvested as hay (1.75 tons) and animal unit months (AUM) of grazing (1 AUM). The first cutting of hay is typically in the beginning of July, then again in late August or grazed until 45 days before frost.

Table 2. Input prices in NWSG budget.

Description	Dollars per unit
Hay market price, per ton	125.00
Pasture, per animal unit month	18.00
Big bluestem seed, per PLS pound	14.00
Indiangrass seed, per PLS pound	15.00
Little bluestem seed, per PLS pound	15.00
Forb seed, per PLS pound	62.50
Nitrogen, per pound N	0.60
Phosphorus, per pound P <sub>2</sub> O <sub>5</sub>	0.62
Potassium, per pound K <sub>2</sub> O	0.41
Lime, per ton applied	27.50
Soil testing, per test	25.00
Glyphosate, per ounce	0.32
Imazapic, per ounce	1.50
Operator labor, per hour	17.31
Operating interest, percent	9.00

## Year 4: Fertilization, hay and graze, full production

Full production is achieved in Year 4, or at least two full years after seeding. Costs include fertilizer applied according to soil test recommendations. Forage yield of 3.5 tons hay and 2 AUM per acre are expected to remain stable in the future if the stand is properly managed.

## Develop your own budget

Farmers can customize this budget by using [Native Warm-Season Grass Planning Budget](https://extension.missouri.edu/media/wysiwyg/Extensiondata/Pro/AgBusinessPolicyExtension/Docs/NWSGBudgets.xlsx) (extension.missouri.edu/media/wysiwyg/Extensiondata/Pro/AgBusinessPolicyExtension/Docs/NWSGBudgets.xlsx). Download the spreadsheet tool to create a copy of your cost and return estimates. Budgets are available for these NWSG scenarios:

1. Big bluestem and indiangrass with no forbs, dormant season planting
2. Big bluestem and indiangrass with no forbs, spring planted following winter cover crop
3. Big bluestem, indiangrass, little bluestem and forbs, dormant season planting
4. Big bluestem, indiangrass, little bluestem and forbs, spring planted following winter cover crop
5. Eastern gamagrass, dormant season planting

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