

Industrial Hemp for Grain Planning Budget

This guide presents information useful to farmers considering industrial hemp production for grain in the 2021 crop year. Table 1 presents income and cost estimates for industrial hemp grain production in Missouri based on prices in October 2020. Assumptions are summarized in Tables 2 and 3. Assumed production is 40 acres. Several assumptions used in this budget are from states such as Kentucky, Tennessee, and North Dakota that have recently grown hemp. Farmers should understand that these assumptions may not fit Missouri production due to lack of Missouri data and different growing conditions in areas where data has been collected. A sensitivity analysis showing the impact on profit of various yields and market prices is included in Table 4.

Table 1. Missouri industrial hemp for grain planning budget for 2021.

	Dollars per acre ¹	Your estimate
Income		
Hemp grain	600.00	
Total income	600.00	
Operating costs		
Seed	105.00	
Fertilizer	60.60	
Machinery operating cost	22.14	
Custom hire and rental	74.90	
Registration and background check	20.00	
Sampling costs	5.63	
Operating interest	6.49	
Total operating costs	294.75	
Ownership costs		
Machinery ownership	71.89	
Real estate charge	150.00	
Total ownership costs	221.89	
Total costs	516.65	
Income over operating costs	305.25	
Income over total costs	83.35	

¹ Totals may not sum due to rounding.

Industrial hemp is more regulated than most other Missouri agricultural commodities. These budgets contain cost estimates for state registration, grower background checks and product sampling and testing costs. It is suggested that producers contact the Missouri Department of Agriculture Industrial Hemp Program to learn the latest regulations surrounding industrial hemp production.

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Table 2. Input assumptions used in Missouri industrial hemp for grain planning budget for 2021.

Selected input quantities	Per acre	Selected input prices	Dollars per unit
Grain yield, pounds	1000	Grain price, per pound	0.60
Seeding rate, pounds	30	Seed, per pound	3.50
Nitrogen rate, pounds N	100	Nitrogen, per pound N	0.31
Phosphorus rate, pounds P ₂ O ₅	30	Phosphorus, per pound P ₂ O ₅	0.38
Potassium rate, pounds K ₂ O	20	Potassium, per pound K ₂ O	0.28
Lime rate, tons	0.6	Lime, per ton	21.00
Fuel for machinery and drying, gallons	5.16	Fuel, per gallon	2.38
Labor, hours	0.64	Labor, per hour	15.50

Table 3. Machinery used in Missouri industrial hemp for grain planning budget for 2021, on a per acre basis.

Machinery activity (including custom fieldwork)	Labor (hours)	Fuel (gallons)	Operating costs ¹ (dollars)	Ownership costs ¹ (dollars)	Total costs (dollars)	Trips across field
Anhydrous application, 200 MFWD	0.08	0.64	2.72	7.30	10.02	1
Tandem disk, fold (21 feet), 160 MFWD	0.16	1.48	6.06	19.92	25.98	2
Presswheel drill (16 feet), 105 MFWD	0.15	0.61	3.74	10.05	13.79	1
Combine flex platform (25 feet), 275 HP	0.13	2.04	6.94	27.29	34.22	1
Rotary mower/conditioner (12 feet), 75 HP	0.11	0.38	2.68	7.35	10.02	1
Dry fertilizer application, custom charge					12.40	2
Grain drying, custom charge					11.00	
Hauling grain to bin, custom charge					2.50	
Hauling grain to market, custom charge					9.00	
Seed cleaning, custom charge					40.00	
Total²	0.64	5.16	22.14	71.89	168.94	8

¹ Machinery operating cost is the sum of fuel, repairs and maintenance, and the value of labor.

² Machinery ownership cost is the sum of overhead and depreciation.

Totals may not sum due to rounding. Abbreviations: MFWD = mechanical front-wheel drive tractor; HP = horsepower.

Table 4. Sensitivity analysis: income over total costs per acre.

Market price (dollars per pound)	Grain yield (pounds per acre)				
	800	900	1000	1100	1200
0.40	-196.65	-156.65	-116.65	-76.65	-36.65
0.50	-116.65	-66.65	-16.65	33.35	83.35
0.60	-36.65	23.35	83.35	143.35	203.35
0.70	43.35	113.35	183.35	253.35	323.35
0.80	123.35	203.35	283.35	363.35	443.35

Farmers can also develop their own cost and return estimates by using the Missouri Industrial Hemp Budget Generator (<https://extension.missouri.edu/media/wysiwyg/Extensiondata/Pro/AgBusinessPolicyExtension/Docs/IndustrialHempBudget.xlsx>).



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