

Barley farming land management



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After receiving my 1, 000 acre land located in Missouri, I decided it was time to choose a crop that would best be fitted for Missouri weather and can be grown during the fall to fit within my crop rotation on my farm. My farm is located within the middle of Missouri on near the Ozarks, which is generally quite hilly. When deciding which crop to use, I used these four factors to narrow down my selection: soil type, cropland site/location, weather, and usability. With these for factors in mind, I chose barley to use as my crop for these acres. I chose barley, because it can also be used for pasturing during times of drought for cattle and other livestock. Additionally, due to my location being quite hilly, barley doesn't like wet areas with poor drainage. Furthermore, with my soil pH testing at 6. 2, barley was most ideal because it does best in pH of 6. 0 or above and is one of the most salt-tolerant crops (Schaffer, et al. 2018).

I determined to plant around September 1st since the use of this crop will be mostly for fall grazing and the time is ideal for barley in my zone of the state. The University of Missouri Extension recommends barley to have a good, firm seedbed and to plant later in the season to increase avoidance of barley yellow dwarf virus (BYDV) injuries. Due to barley being less winter-hardy, I will plant 1 to 1. 5 inches deep to allow for better established root development during the winter months. " Because barley seed is larger in volume and weighs less than wheat, you should plant 2 to 2. 5 of vigorous seed with germination exceeding 85 percent (Schaffer, et al. 2018). This will assist the crop in being used for pasture by establishing good root growth and decreasing heaving damage. Heaving damage is caused by the wide temperature fluctuations exposing soil surfaces and causing them to freeze

and thaw repeatedly (Haynes, 2018). This causes small ice particles to form in the soil and potentially reduce the amount of water and nutrients the plant can uptake, which can decrease final yield.

In determining which seed variety to use, I used the research conducted by the University of Missouri Extension on barley in the state and selected 'Post' variety due to its better resistance to BYDV and ability to survive it better if present. Specifically, I will use ATLANTIC post variety due to its high yielding, moderately early heading and good winter headiness (Fall Seeded Crops, 2017). This seed is pre-treated and resistant to powdery mildew, barley yellow dwarf virus, greenbug, and moderately resistant to leaf rust. I chose to buy a pre-treated seed out of convenience and to reduce the amount of pesticide usage later in production. This also reduces the chance that my final yield will be reduced. By using a pre-treated seed with a fungicide it helps to reduce seed and seedling infections (Schaffer, et al. 2018).

When considering no-till verse conventional tillage, I relied mostly on research to help determine which system to implement. Under various studies, barley yielded higher grain yields under no-till when compared with conventional tillage systems. Under no-till systems, barley resulted in greater soil water storage until tillering (Plaza-Bonilla, et al., 2017). It was also discovered that when nitrogen application was applied during one application under no-till systems, nitrogen efficiency and uptake were greater than conventional tillage systems (Plaza-Bonilla, et al., 2017). Due to these results, I will use a no-till system with my barley cropland to ensure I have higher yields and better nutrient absorption.

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Nutrient management is very important to a proper growing crop. " Correct rate and timing of the application of fertilizers to barley is important to achieve the highest level of nutrient use efficiency, which maximizes crop productivity whilst minimizing any environment impact (YARA, 2018)."

Timing of application of fertilizers such as nitrogen, phosphorus and sulfur are also important to soil health and final yield. " If soil nitrogen levels are low then seedbed nitrogen for winter barley can give improved establishment and final yields (YARA, 2018)." Phosphorus is almost as important as nitrogen and often forgotten. Phosphorus is influential for plant growth and development in barley, because as it develops the plant moves its reliance on soil phosphorus to further leaf growth. Sulfur is becoming a more popular fertilizer to be applied to barley. " Sulfer is a critical nutrient required by barley to ensure continued growth of the developing shoots (YARA, 2018)." Sulfur is known to allow for the formation of amino acids that form proteins within the plant that assist in plant development as well. These three nutrients are the most important to balance for proper plant growth. I will apply phosphorus, sulfur, nitrogen and micronutrients to ensure proper plant growth and to ensure that final yield is increased rather than compromised.

Pests are anything that cause harm or a decrease in plant growth or production. The most common pests that cause harm to a plants growth is insects. Armyworms, Aphids, Fall armyworm and grasshoppers and various other insects are the most common insects that influence barley (Schaffer, et al. 2018). All of these pests decrease plant growth/development in some sort such as leaf defoliation, final grain yield and many more. The best insect

management protocol is a combination of a variety of strategies. First management strategy is to scout and monitor threshold of the pest in question. This allows you to determine the severity of the infestation and the damage caused at time of scouting. Damage by insect to a certain extent doesn't always decrease final yield, which is why scouting is the first strategy. Second strategy that needs to be implemented is chemical control selected specifically to treat the pest(s) in question. By selecting a chemical pesticide specific to the pest we increase our chances in eliminating the pest more effectively. Chemical controls also go hand-in-hand with scouting, as chemicals do not need to be applied until a threshold is reached as chemical control won't be cost efficient if a certain population isn't present. Lastly, a chemical control rotation program also will need to be implemented. This is very important as we do not want to increase resistance to pesticides. By rotating chemical controls, we will ensure resistance likelihood is reduced. As with any chemical control protocols, it is also important to follow the directions on proper dosage and application processes that the specific pesticide recommends. Resistance and likelihood of not eliminating the pests in total increases with improper application and dosage strength. By implementing these three strategies along with proper application and dosage I can manage insect and mite pests.

Weed management is another crucial role in managing barley as a crop. Weeds compete with the crops for nutrients in the soil and sunlight, potentially reducing yield and development. Due to this, we want to reduce the amount of weeds present in the field. Much like insect and pest control, we will scout our fields regular and monitor weed populations. When doing

so, I will also record what specific weeds are present to ensure I use the proper herbicide based off the weed in question. This will also allow us to reduce the likelihood of resistance growth, because we are treating on an as-needed basis and targeting specific species. In general situations, I will be using a 2, 4-D herbicide that targets marehail, mustards, and dandelions as a later post emergent herbicide. This specific herbicide is applied during the 3-6 growth stage of barley (Lingenfelter & Curran, 2018).

Disease management is just as important as the other management practices mentioned above. Diseases are generally caused by the following: head diseases that damage kernels and their quality, virus diseases that affect the plant systemically, foliar diseases caused by fungi or bacteria that affect leaf tissues, and seed/seedling diseases that result in poor germination or death of the seed (Schaffer, et al. 2018). The biggest strategy for disease control is prevention. To practice disease prevention, I will be implementing various strategies. First, I will only use high-quality seed that have been treated with an approved seed-treatment and cultivars that are resistant to foliar diseases. Secondly, while barley will be the main crop I will raise, I will implement a two year crop rotation with other small grain crops. Third, when weather conditions favor disease, I will scout my fields and use foliar fungicides if necessary. Lastly, I will scout and control insect/pests as needed with proper application, dosage, and type of pesticides. Disease management is about having other efficient other management strategies such as pest control, variety selection, seed-treatments, etc. that assist in preventing diseases.

While I am growing barley as a pasture crop secondary, harvest is possible as silage or hay. With pasture barley, it is important that the cattle or livestock in use of the pasture are removed prior to onset of jointing. Jointing is “ the growth stage in which the first node and head emerge above ground level (Schaffer, et al. 2018).” After the livestock are removed, the barley crop will be treated like any other crop. It is recommended by Michigan State University Extension to harvest small grains used for pasture during the early dough stage, or the stage where the grain head begins to turn doughy (Min, 2012). It is best to harvest at the dough stage if the crop is going to be used for silage. If the crop is going to be used for hay it can be cut as early as the boot stage. I am unsure at this point which product I would like to harvest my barley crop for, so I will include both in my crop calendar. To reduce harvest losses, all harvest machinery will be calibrated and cleaned properly before harvest time. When harvest begins, equipment will be rechecked to ensure proper calibration. This can be done by performing a yield area test while harvesting. By selecting a 10 ft² space the length and width of header swath. By putting this area in front and behind of the combine, this will allow me to see the amount of harvest lost due to machine error of the said area. By calculating the total loss of this area, I can determine the actual loss by the machine. If the loss is roughly three percent, then the machine is working well enough to continue harvest. However, if it is greater than three percent then the machinery needs to be recalibrated. By performing these tasks, I can reduce the harvest losses due to machinery.

By implementing the above strategies, my crop of barley should be quite successful. All of the above strategies will not be successful without the

others being implemented as well. Controlling weeds, pests, nutrient application and managing harvest losses will reduce the likelihood of a decreased final grain yield. For a successful crop production of any crop, all strategies must coexist fluently. Below you can find my crop calendar of when I will implement certain strategies based off plant growth, pest infestation and harvesting using the Zadok's Scale (calendar is subject to change based on climatic, insects/pest and weed issues).

September 2018

Sun	Mo	Tu	We	Th	Fri	Sat
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*Monthl

y Note:

Scout

weekly

for

disease

and

pests!

1

Seed

fields

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Barley

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23 24 25 26 27 28 29

30

October 2018

Sun	Mon	Tu	We	Th	Fri	Sa
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*Monthly	1	2	3	4	5	6

Note: Scout
 weekly for
 disease and

disease and
pests!

4		5	6	7	8	9	10	
								17
								Pull
11		12	13	14	15	16		livestock off fields (if not already)
								24
								Stop late
18		19	20	21	22	23		herbicide use (if necessary)
25		26	27	28	29	30		

December 2018

Sun Mon Tu We Th Fri Sat

e d u

*Monthly

Note: Scout

weekly for 1

disease and

pests!

2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

January 2019

		Tu	We			
Sun	Mon	e	d	Thu	Fri	Sat

*Monthly Note: 1

Scout weekly for

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disease and pests!

2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

February 2019

		Tu	We			Sa
Sun	Mon	e	d	Thu	Fri	t

*Monthly Note:

Scout weekly for
disease and
pests!

1

2	3	4	5	6	7	8
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Insecticide \$12. 00

3. Machinery Costs

Operating Machinery \$10. 00

Machinery Leasing \$2. 88

Crop Insurance \$7. 62

Hail Insurance \$5. 04

Other Expenses \$8. 00

Land Taxes \$15. 00

Interest on Operating \$4. 29

Total Operating \$192.
01

B) Fixed Costs

Land Investment
Costs \$64. 68

Machinery
Depreciation \$45. 71

Machinery Investment \$18. 76

Storage Costs	\$10. 20
Total Fixed	\$139. 35
Total Fixed & Operating	\$331. 36

C) Labor

4. Labor Costs

Paid Labor	\$30. 00
Total Costs	\$361. 36

Profit Analysis

5. Estimated Farmgate

Target Price \$ per unit \$3. 85

Target Yield per acre 73

Unit Type bu

Gross Revenue/acre \$281.
05

(Prices and expenses were used by data collected for the 2018 barley guidelines with influences of prices for specific expenses I used in my article)

Citations:

Schaffer, J. A., Palm, E., & Munson, R. E. (n. d.). Barley. Retrieved from <https://extension2.missouri.edu/g4312>

Haynes, C. (n. d.). Frost Heaving Perennials. Retrieved from <https://www.extension.iastate.edu/news/2006/mar/070202.htm>

Fall Seeded Crops. (2017, August). *Missouri Seed Directory*. doi: <http://moseed.org/wp-content/uploads/2017/06/2017FallDirectory.pdf>

Plaza-Bonilla, D., Cantero-Martinez, C., Bareche, J., Arrue, J. L., Lampurlanes, J., & Alvaro-Fuentes, J. (2017). Do no-till and pig slurry application improve barley yield and water and nitrogen use efficiencies in rainfed Mediterranean conditions? [Abstract]. *Field Crops Research*, 203 (1), 74-85. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0378429016308267>.

YARA, UK. (2018, January 25). Barley optimal rate and timing of nutrients. Retrieved from <https://www.yara.co.uk/crop-nutrition/barley/barley-optimal-rate-and-timing-of-nutrients/>

Lingenfelter, D., & Curran, W. S. (2018, October 16). Fall Weed Control in Wheat and Barley. Retrieved from <https://extension.psu.edu/fall-weed-control-in-wheat-and-barley>

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Min, D. (2012, April 2012). Using small grains for forage- MSU Extension. Retrieved from [https://www. canr. msu. edu/news/using_small_grains_for_forage](https://www.canr.msu.edu/news/using_small_grains_for_forage)

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