



### Introduction

**Greetings! We are a team of researchers at Montana State University working on a research study on lentil production.** Our research goal is to learn about management, environmental, economic, and social aspects of lentil production in the region. Specifically, our team is interested in understanding the perceptions of lentil producers from small-scale to large-scale production systems. If you choose to participate in this survey, you will be presented with a series of 33 questions divided into four sections. It is expected that this survey will take approximately 15-20 minutes to complete. The option to complete this survey is voluntary.

We plan to use survey findings to prepare education material such as brochures and write research articles. Survey responses will be anonymously reported outside our research team (your name and affiliation will not be included).

We are offering a \$25 gift card to Amazon.com for those who complete the survey before February 1st, 2018. **In order to participate in this survey, you must be a lentil producer in the United States or Canada who has grown lentils for at least one growing season.**

If you have further questions, concerns, or suggestions, please do not hesitate to contact our research team or the Chair of the Montana State University Institutional Review Board, Mark Quinn, (406) 994-4707 (mquinn@montana.edu).

We are grateful for your consideration of participating in this study by sharing your time and experiences regarding lentil production.

Thank you,

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#### **CONTACTS:**

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Informed Consent

\* 1. Do you agree to participate in this study?

**Yes**

Yes, I am willing to voluntarily participate in the study outlined above by responding to the following survey questions. I give permission for you to include my anonymous survey responses in your research analysis and publication material (my name and affiliation will not be included). I understand that in order to participate in this survey, I must be a lentil producer in the United States or Canada who has grown lentils for at least one growing season.

**No**

No, I would not like to participate in the study outlined above. I understand my decision will be respected by the research team and I will not face any risk or discrimination based on my decision

If yes, please sign and date below.

2. Would you like to receive a \$25 Amazon.com gift card if you are among the first 100 respondents to complete this survey?

Yes

No

If you would like to receive a gift card, please include your mailing address. Your name and address will remain anonymous and only be viewed by the research team to mail the gift card.



Part I: Background of Production System

**For multiple choice questions, please check the most suitable response (unless otherwise indicated).**

1. What is the approximate acreage of your farm?

Total acreage

2. What is the total acreage of your lentil production system?

- Less than 100 acres
- Between 100 - 500 acres
- Between 500 - 1,000 acres
- Greater than 1,000 acres

3. How do you classify your lentil production system?

- Conventional
- Organic
- Both Conventional and Organic
- Other (please specify)

4. Where is your farm located (state or province)?

- Alberta
- Idaho
- Montana
- North Dakota
- Saskatchewan
- Washington
- Other

Please specify **Montana** county, or list **state/province** if "Other" was selected

5. In the past **5 years (between 2013-2017)**, how would you describe the change in the area of land dedicated to lentil production?

- I have decreased the area of land for lentil production
- I have increased the area of land for lentil production
- My lentil production has stayed the same

If there was a decrease or increase in the area of land for lentil production, please describe what factors motivated this change.

6. Do you own or rent/lease the land you produce lentils on?

- I own the land
- I rent/lease the land
- Both (I own *and* rent/lease some of the land I produce lentils on)
- Other (please specify)

7. How long have you produced lentils?

- Under 1 year
- 1 - 5 years
- 6 - 10 years
- 11 - 15 years
- More than 15 years

8. What type of lentils do you produce? (select all that apply)

- Black
- Brown/Spanish pardina
- French green
- Large green (such as Laird)
- Medium green (such as Richlea)
- Red
- Small green (such as Eston green)
- Other (please specify)



## Part II: Management of Lentil Production System

1. What are your current management practices for lentil production? (select all that apply)

- Chemical desiccant
- Conservation tillage
- Cover cropping
- Crop rotations
- Dryland
- Fungicide treated seed
- Inorganic fertilizer
- Land rolling
- No-till practices
- Organic certified
- Precision agriculture
- Swathing
- Till
- Use of irrigation
- Utilizing rhizobium inoculants
- Other (list the management practices that you implement in your lentil production system)

2. Please select all of the statements below regarding agricultural management that you **agree** with.

- I produce lentils for brown manure
- I produce lentils to diversify my crop rotation
- I produce lentils to offset fertilizer costs
- I produce lentils for green manure
- I produce lentils to offset herbicide costs / improve herbicide use
- I produce lentils to offset irrigation needs

3. Please select all of the statements below regarding environmental observations that you **agree** with.

- I have observed pests and disease impacting my lentil production
- I have observed increased temperatures impacting my lentil production
- I have observed drought stress impacting my lentil production
- I have observed extreme weather events impacting my lentil production

4. Please select all of the statements below regarding the inclusion of lentils in your production system that you **agree** with.

- The addition of lentils in my production system has decreased moisture availability for subsequent crops
- The addition of lentils in my production system has helped increase yield in overall food crop production without expanding acreage on one or more occasion
- I have experienced inefficient nodulation in my lentil production system
- The addition of lentils in my production system has increased nutrient availability for subsequent crops
- The addition of lentils in my production system has resulted in reduced tillage or other soil disturbance
- The addition of lentils in my production system resulted from using no till management
- I find that rhizobium inoculants have been sufficient to ensure maximum nodulation in the lentils most of the time
- I have experienced soil erosion in my lentil production system on one or more occasion
- The addition of lentils in my production system helps transfer nitrogen to the subsequent crop

5. How do you characterize lentil crop quality? (select all that apply)

- Brightness of color
- Percentage of splits
- Size
- Other (please specify)

6. Do you know any agricultural management practices that produce greater quality lentils?

- Yes
- No

If yes, please list the specific agricultural management practices

7. From an agricultural management standpoint, what are your top three challenges producing lentils?

Challenge 1

Challenge 2

Challenge 3



Part III: Social, Economic, and Health Dimensions of the Lentil Production System

1. What do you value regarding lentil production? List the top 3 reasons you value including lentils in your production system.

Reason 1

Reason 2

Reason 3

2. Please select all of the statements below regarding market access over the past **5 years (between 2013-2017)** that you **agree** with.

I have adequate access to a consistent market for my lentils

I have adequate access to a profitable market for my lentils

I have adequate access to distribution channels for my lentils

3. Please select all of the statements below regarding the effects of markets and policy factors over the past **5 years (between 2013-2017)** that you **agree** with.

Market variability, such as consumer demand, impacts my lentil production

Tariffs or subsidies impact my lentil production

Cost of labor impacts my lentil production

Fuel costs impact my lentil production

4. Please select all of the statements below regarding the economic and health aspects of lentil production that you **agree** with.

I grow lentils to capitalize on dryland production

I grow lentils as a cash crop

I grow lentils to support local food security

I grow lentils because of their nutritional properties

I grow lentils to support plant-based diets / plant-based protein sources

5. Approximately what percentage of your income, as an average or approximation over the past **10 years (between 2008-2017)**, comes from lentil production?

- Less than 5%
- Between 6 - 15%
- Between 16 - 25%
- Greater than 25%

6. Do you or your family eat the lentils you produce?

- Often (they are a regular part of our diet)
- Sometimes (maybe once a week)
- Rarely (once a month)
- No (lentils are not consumed in our household)

If not, please list main reasons.

7. Who did you get the information or knowledge from regarding growing lentils? (select all that apply)

- Extension
- Farming magazines
- Family
- Friends or neighbors
- Pulse commodity associations or cooperatives
- Seed dealers
- Processers
- Other (please specify)

8. Do you utilize a social network (family, friends, neighbors, others) for any of the following situations regarding lentil production? (select all that apply)

In the event of crisis/emergency

Equipment sharing

Hired labor

Knowledge/information sharing

Other (please specify)

9. Please select all of the following statements concerning North American consumer knowledge of lentil consumption that you **agree** with.

Consumers are generally knowledgeable regarding the nutrient benefits of lentils

Consumers are generally knowledgeable regarding how to incorporate lentils into their diets in a nutritionally balanced way

Consumers are generally knowledgeable regarding how to cook with lentils

Consumers generally find the taste of lentils as desirable



Part IV. Global Change: Challenges and Opportunities

1. Considering the rising cost of energy, are you planning to do anything different on your farm in the next season or the near future? (select all that apply)

- Change my management practices
- Conduct an energy audit of my farm
- Explore alternatives such as wind or solar energy production
- Plant a fuel crop
- Reduce energy consumption
- Subdivide land
- Try to develop a local market for biofuels
- Use alternative fuels available on the market
- Use biofuels on my own farm and/or in my home
- Other (please specify)

2. Of the crops and products listed below, which do you think have potential for success in helping to meet local/regional/national future needs for energy? (select all that apply)

- Algal biofuels
- Animal manure
- Biodiesel from small grains
- Corn for ethanol
- Cellulosic biomass (the fibrous, generally non-edible portions of plant matter)
- Perennial grasses (switchgrass, miscanthus)
- Plant wastes (vegetable oils, etc.)
- Other (please specify)

3. If you were thinking about growing an energy crop in the next season or the near future, which of the following factors would influence your decision? (select all that apply)

- Concern about using resources to produce food versus fuel
- Creating jobs in my community
- Delayed economic returns (investments in year one, profits in later years)
- Government subsidy
- Improved national energy security
- Improving soil quality, including building organic matter
- Infrastructure to use the energy crop (transportation, power plants, home heating, etc.)
- Keeping the landlord happy
- Market potential for the crop
- Need for special equipment
- Potential for other uses (and markets) in addition to energy
- Reducing carbon dioxide emissions
- Reducing inputs
- Reducing labor
- Reducing nitrogen runoff
- Reducing wear and tear on equipment
- The availability of enough water to process the crop
- Other (please specify)

4. Please indicate which statement below best corresponds to your view regarding weather variation and weather extremes on your agricultural business.

- El Niño or the La Niña cycle of weather patterns has had an effect on my agricultural business on one or more occasion
- I have experienced the effects of climate change on my agricultural business on one or more occasion
- Normal weather cycles explain most or all recent changes in climate, which have had an effect on my agricultural business on one or more occasion
- I have not experienced the effects of weather variation and weather extremes on my agricultural business
- Other (please specify)

5. In the next 20 years, do you expect extreme weather patterns and/or climate change to impact your average lentil crop yield?

I expect an increase in my average yield

I expect a decrease in my average yield

I expect my yield to stay the same

I will not be growing lentils in 20 years

Other (please specify)

6. In the next 20 years, do you expect producers in your area to make a significant change in their crop rotation due to extreme weather patterns and/or climate change?

Yes

No

Not sure

7. Overall, what are your top 3 greatest concerns for the future regarding lentil production?

Concern 1

Concern 2

Concern 3

8. Overall, what do you think are the top 3 opportunities for the future that you are hopeful for regarding lentil production?

Opportunity 1

Opportunity 2

Opportunity 3

9. Is there anything regarding lentil production you would like to share that was not asked about?