

INFORMATION STATEMENT



Dear Participant,

Greetings. Welcome to the Fungicide Resistance Management Survey - **What HAS AND HAS NOT WORKED FOR YOU?**

The Centre for Crop and Disease Management (CCDM) through its Economics Foundation Project “Improving the return on investments in crop protection at the farm and industry scales” and Barley Disease Cohort Project is inviting you to share information on your fungicide resistance management strategies with us in an anonymous survey.

Your involvement will help prepare industry relevant information for managing fungicide resistance in Barley.

The survey results will enable us to understand the obstacles and constraints associated with the practical management of fungal diseases in barley. Further, the survey findings will be used to identify effective, practical and economical crop protection strategies and tactics for protection of crops against fungal diseases and to minimise the impacts of fungicide resistance on return on investment.

Before beginning the survey, you will be asked to (i) consent to participate in the study and (ii) consent to have your responses audio-recorded. The consent to participate is obtained when the participant indicates “yes” to the first statement. The consent to record the response is obtained when the participant indicates “yes” to the second statement. Please note that this recording will only be used by the researchers to transcribe your responses and will not be linked to you in any way.

Participants will be asked if they have any questions before the survey begins. Participants who provide consent to participate in the study will be asked the survey questions and their responses will be recorded/transcribed by the researcher. This process is expected to take about 20-25 minutes.

The information collected in this research will be non-identifiable (anonymous). This means that we do not need to collect individual names or information is anonymous and will not include a code number or name. No one, not even the research team will be able to identify your information. Therefore, there is no expected risk to you for participating in this study. The following people will have access to the information we collect in this research: the research team and, in the event of an audit or investigation, staff from the Curtin University Office of Research and Development.

Electronic data will be password-protected and hard copy data (including audio tapes) will be in locked storage. The information we collect in this study will be kept under secure conditions at Curtin University for 7 years after the research is published and then it will be destroyed. All the information collected through this interview will be reported in an aggregate form and will not be linked to you in anyway. The results of this research may be presented at conferences or published in professional journals. You will not be identified in any of the results published or presented.

Please answer all the questions in this questionnaire and give the responses that most accurately reflect your agribusiness. Your participation is completely voluntary and you are free to ask to withdraw at any time. *The chief investigator for this project is CCDM’s Director, Professor Mark Gibberd (08 9266 7907 or m.gibberd@curtin.edu.au) and the co-investigators are Dr. Toto Olita (CCDM) and Dr. Billy Sung (School of Marketing, Curtin Business School).*

Curtin University Human Research Ethics Committee (HREC) has approved this study (HREC number HRE2020-0440). Should you wish to discuss the study with someone not directly involved, in particular, any matters concerning the conduct of the study or your rights as a participant, or you wish to make a confidential complaint, you may contact the Ethics Officer on (08) 9266 9223 or the Manager, Research Integrity on (08) 9266 7093 or email hrec@curtin.edu.au.

This study is part of a multi-disciplinary project funded through a co-investment with CCDM and Grains Research and Development Corporation (Project number CUR00023) phase II grant funding.

Prompt: Do you have any questions?

CONSENT FORM

1. The interviewer has read the information the information statement and I understand its contents.
2. I believe I understand the purpose of this research project.
3. I have been given an opportunity to ask questions and I am satisfied with the answers I have received.
4. I understand that this project has been approved by Curtin University Human Research Ethics Committee and will be carried out in line with the National Statement on Ethical Conduct in Human Research (2007).
5. I believe that there is no expected risk to me for participating in this study.

I provide consent to participate in this study (Please specify only one response)

- Yes
- No

I provide consent for my responses to be audio recorded during the interview. *Please note that this recording will only be used by researchers to transcribe your responses and will not be linked to you in any way.*(Please specify)

- Yes
- No

If you have provided consent to take part in this study, please indicate the date and time and begin the survey.

	Please specify
Date	<input type="text"/>
Time	<input type="text"/>

Fungicide resistance knowledge.

We would like to know more about your fungicide resistance knowledge.

What words would you use to define fungicide resistance?

What, in your opinion, causes fungicide resistance?

What control do you have over the emergence of fungicide resistance on your farm?

We would like to know more about disease management on your farm

Who makes fungicide application decisions on your farm? (Please select all that apply)

- Grower (Self)
- Agronomist/Advisor
- Other (Please specify)

When managing diseases in barley:

What fungicides do you use for **Seed/In-furrow treatment**? (Please specify if applicable)

Product Name(s):

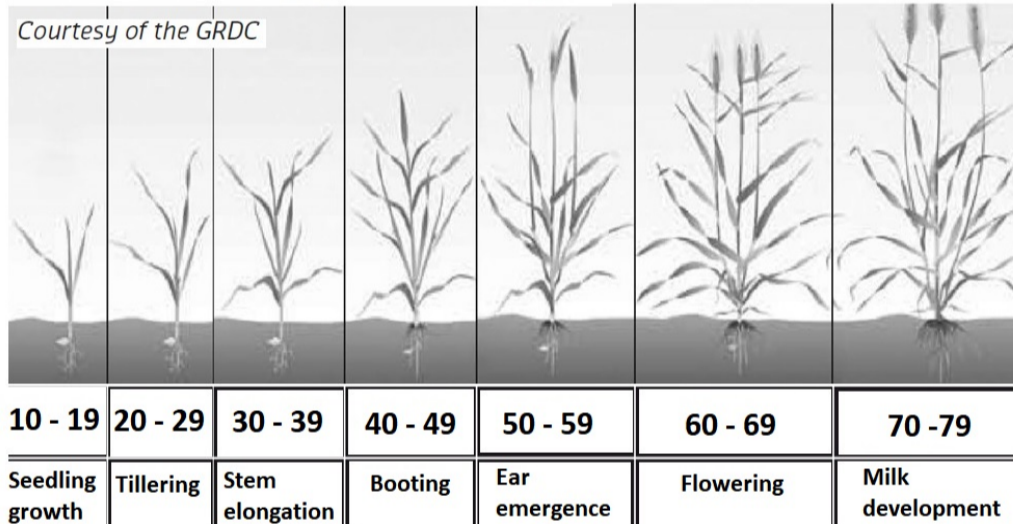
Product Rate:

What fungicides do you use for **First Foliar treatment**? (Please specify if applicable)

Product Name(s):

Product Rate:

Guide to barley growth stages



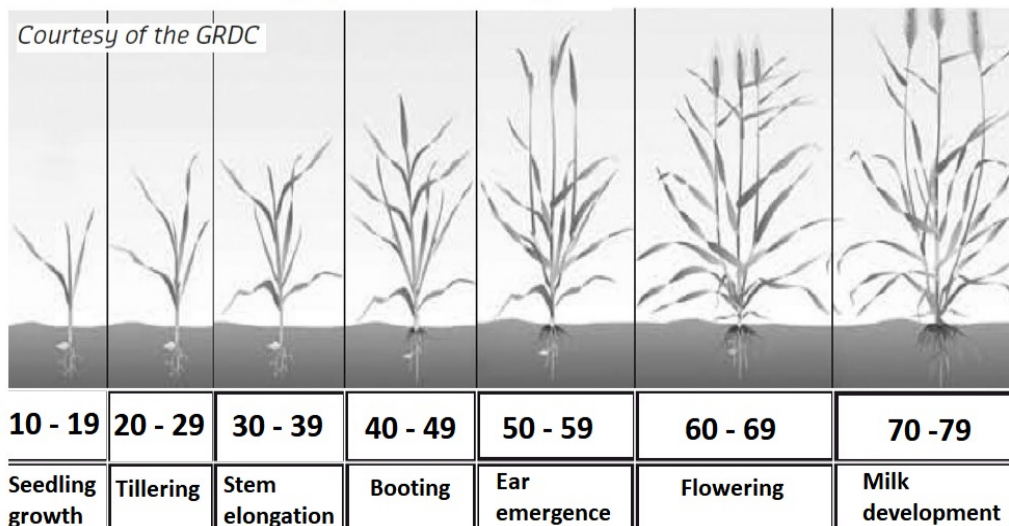
Please Specify Growth Stage:

What fungicides do you use for **Second Foliar treatment**? (Please specify if applicable)

Product Name(s):

Product Rate:

Guide to barley growth stages



Please Specify Growth Stage:

When managing diseases in barley:

What factors do you take into account when making the following fungicide application decisions? (Please specify if applicable)

Seed/In-furrow treatment:

First Foliar Fungicide treatment:

Second Foliar Fungicide treatment:

When managing diseases in barley:

Can you give us an estimate of how much you spend on **Seed/In-furrow treatment** (application and product)? (Please indicate amount per hectare)

 \$/hectare

Does the above cost also include the cost of herbicide and pesticide applications? (Please select only one option)

- Yes
- No
- Not applicable

When managing diseases in barley:

Can you give us an estimate of how much you spend on **First Foliar Fungicide treatment** (application and product)? (Please indicate amount per hectare)

 \$/hectare

Does the above cost also include the cost of herbicide and pesticide applications? (Please select only one option)

- Yes
- No
- Not applicable

When managing diseases in barley:

Can you give us an estimate of how much you spend on **Second Foliar Fungicide treatment** (application and product)? (Please indicate amount per hectare)

 \$/hectare

Does the above cost also include the cost of herbicide and pesticide applications? (Please select only one option)

- Yes
- No
- Not applicable

When managing diseases in barley:

How would you **rate the total cost of disease management** on your farm? (1 - Unaffordable to 7 - Affordable)

	1	2	3	4	5	6	7
Please indicate on slider							

We would like to know more about fungicide application pattern on your farm.

What is your assessment of the fungicide application pattern on your farm? (1 - Strongly disagree to 7 - Strongly agree). * NA - Not Applicable.

	1	2	3	4	5	6	7	NA
I have an annual agronomic spray plan.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually alter the spray plan depending on the weather condition.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually alter the spray plan depending on the disease pressure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually scout for disease before applying fungicides.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually use fungicide mixtures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually use full label rates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I stick to the spray plan no matter what.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify): <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Impact of fungicide resistance problem on productivity

Considering the following definitions:

Fungicide sensitivity – fungicide application is effective;

Reduced fungicide sensitivity – fungicide application is less effective and

Fungicide resistance – fungicide fails to provide an acceptable level of control of the target pathogen in the field at label rates.

Are you aware whether fungicide resistance exists in your farm? (Please select only one option)

- Yes
- No
- Unsure

Were your samples tested for fungicide resistance? (Please select only one option)

- Yes
- No
- Unsure

Have you seen reduced effectiveness of fungicide treatment in your farm? (Please select only one option)

- Yes
- No
- Unsure

If you believe fungicide is less effective or fungicide resistance is present in your farm, please **specify the name of fungicide that is affected** (if applicable):

Fungicide is less effective:

Fungicide resistance observed:

Importance of fungicide resistance management

How would you **rate the importance** of fungicide resistance management to your agri-business? (1 - Not important to 7 - Very important)

Please indicate on slider

The slider scale consists of a horizontal line with vertical tick marks at 1, 2, 3, 4, 5, 6, and 7. A grey slider bar is positioned at the 1 mark.

Based on your rating of the importance of fungicide resistance management in the previous question, **why** do you think fungicide resistance management is important/not important to your agri-business?

Barley Production

Given your 2019 barley production, please indicate the following (if applicable):

What was your **estimated yield potential** at the **beginning** of the **2019** growing season? (Please indicate value per hectare)

tonnes/hectare

What was your **estimated break-even yield** at the **beginning** of the **2019** growing season? (Please indicate value per hectare)

tonnes/hectare

What was your **actual yield** at the **end** of the **2019** growing season? (Please indicate value per hectare)

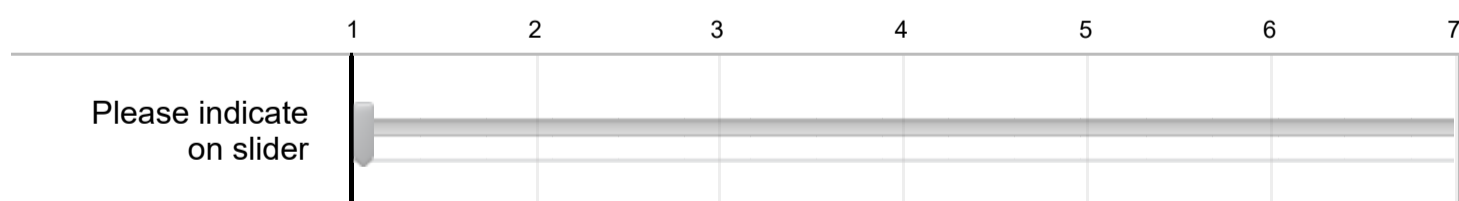
tonnes/hectare

Risk/opportunities

What factors (risk/opportunities) influenced the actual yield at the end of the 2019 growing season? (Please specify)

Disease pressure

In your opinion, how would you rate the **disease pressure** on the barley paddocks in the 2019 growing season? (**1 - Low disease pressure to 7 - High disease pressure**)



Consider your **current investment (\$/hectare)** in fungicide treatment, what would be your **maximum acceptable percentage of yield loss (%)**?

% Yield loss if I spend \$/hectare on fungicide treatment.

We would like to know more about your fungicide resistance management practices

What fungicide resistance management practices do you currently use in your farm? (Please specify)

How **often do you use** the following fungicide resistance management practices on your farm? (1 - Not at all to 7 - Very often)

	1	2	3	4	5	6	7
Change mode of action.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use fungicide mixtures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rotating new chemistry.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rotating crops.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stubble management.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use resistant varieties.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (Please specify): <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What **factors motivate you** to implement fungicide resistance management practices on your farm? (Please specify)

Are there any **factors that may stop you** from implementing fungicide resistance management practices on your farm? (Please specify)

How would you rate your **willingness to adopt** fungicide resistance management practices if you observed the following on your farm? (1 - Very unlikely to 7 - Very likely)

	1	2	3	4	5	6	7
Reduction in productivity relative to the current state.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of disease control from current fungicide use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rise in the cost of fungicide treatment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Receipt of positive fungicide resistance results.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (Please specify): <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Cost managing Fungicide resistance

If fungicide resistance were likely to affect your return on investment, **how much extra** are you willing to **invest per hectare** to prevent or at least delay the **fungicide resistance problem**? (Please indicate amount per hectare)

\$/hectare

We would like to know more about your sources of fungicide resistance management

When managing fungicide resistance on your farm, what **sources of fungicide resistance management information** do you access? (Please specify)

How **often to do use** the following sources of fungicide resistance management information? (1 - Not at all to 7 - All the time). * NA - Not Applicable.

	1	2	3	4	5	6	7	NA
Face to face contact with agronomist/advisor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print media e.g., newsletters, newspapers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online media platform e.g., podcasts, websites.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Field days or grower forums.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social media e.g., twitter.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apps.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CCDM's Barley Disease Cohort Project.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (Please specify): <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Based on your answers provided above, **why do you prefer to use the top three sources** of fungicide resistance management information? (Please specify)

How **accessible** are the following sources of fungicide resistance management information? (1 - Difficult to access to 7 - Very easy to access). * NA - Not Applicable.

	1	2	3	4	5	6	7	NA
Face to face contact with agronomist/advisor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print media e.g., newsletters, newspapers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online media platform e.g., podcasts, websites.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Field days or grower forums.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social media e.g., twitter.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apps.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CCDM's Barley Disease Cohort Project.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (Please specify): <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How **timely** are the following sources of fungicide resistance management information? (1 - Not timely to 7 - Very timely). * NA - Not Applicable.

	1	2	3	4	5	6	7	NA
Face to face contact with agronomist/advisor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print media e.g., newsletters, newspapers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online media platform e.g., podcasts, websites.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Field days or grower forums.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social media e.g., twitter.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apps.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CCDM's Barley Disease Cohort Project.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (Please specify): <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Value of information provided by the Barley Disease Cohort project

In the 2019 Growing season. Did you participate in the Centre for Crop and Disease Management (CCDM) Barley Disease Cohort project? (Please select only one option)

- Yes No Unsure

How **useful** was the information provided to manage fungicide resistance on your farm? (1 - Not useful to 7 - Very useful)

	1	2	3	4	5	6	7	Unknown
Disease diagnosis of the samples from your farm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fungicide resistance diagnosis of the samples from your farm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fungicide management recommendations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How would you rate your **ease to understand** the information provided to manage fungicide resistance on your farm? (1 - Easy to understand to 7 - Difficult to understand)

	1	2	3	4	5	6	7	Unknown
Disease diagnosis of the samples from your farm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fungicide resistance diagnosis of the samples from your farm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fungicide management recommendations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How **timely** was the information provided to manage fungicide resistance on your farm? (1 - Not timely to 7 - Very Timely)

	1	2	3	4	5	6	7	Unknown
Disease diagnosis of the samples from your farm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fungicide resistance diagnosis of the samples from your farm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fungicide management recommendations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What other information would you like to access to assist you to manage fungicide resistance on your farm? (Please specify)

Demographic/general questions

The following section contains demographic questions that are used to help classify information. Your responses will not be linked to you in anyway and will remain confidential.

We would like to know more about your **Barley production program in the 2019 growing season:**

Can you give us an estimate of the **total area under Barley production?** (Please indicate value)

hectares

What was the **soil texture/type** in the Barley production area? (Please specify)

What **barley varieties** did you use? (Please specify)

What was the **distribution of barley varieties** in the farm? (Please specify: e.g., 4 paddocks, 1 variety)

Barley paddock(s) Barley variety (varieties)

What **crop/pasture** was grown on this site in the **2018 growing season**? (Please specify)

Demographic questions

Demographic questions: Your responses will not be linked to you in anyway and will remain confidential.

Can I please have the post code of your farm?

What is your gender? (Please specify)

- Female
- Male
- Non-binary
- Prefer not to disclose

If you don't mind, what is your age?

 years

How many years have you been in the Agriculture Industry? (Please specify)

 years

Are you currently a member of any grower groups/associations? (Please select only one option)

- Yes
- No
- Other (Please specify)

What is your highest level of education? (Please select only one option)

- Less than high school
- High school graduate
- Diploma
- Bachelor degree
- Postgraduate degree
- Doctorate
- Other (Please specify):

This is the end of survey. Thank you for your participation!

Working together to find locally relevant and economically sound solutions to fungicide resistance.

