Aggressiveness and fungicide sensitivity of *Alternaria alternata* isolates from blueberry orchards in South Africa

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Co-supervisors: Dr. W. de Bruin, Dr. N. Siyoum & Dr. D. Nsibo

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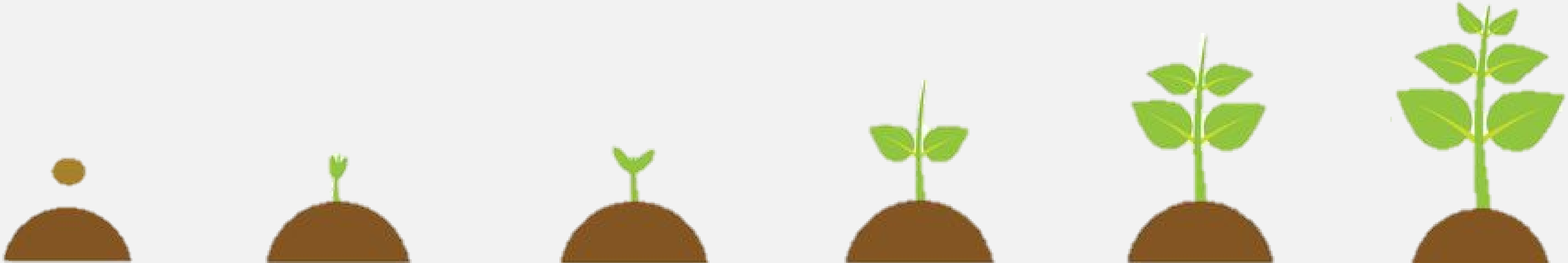
Blueberry Research Timeline

Final Year Blueberry Research Project

1. Blueberry nurseries
2. Commercial farms
3. Packhouses

2019 | 2022 | 2023 | 2024

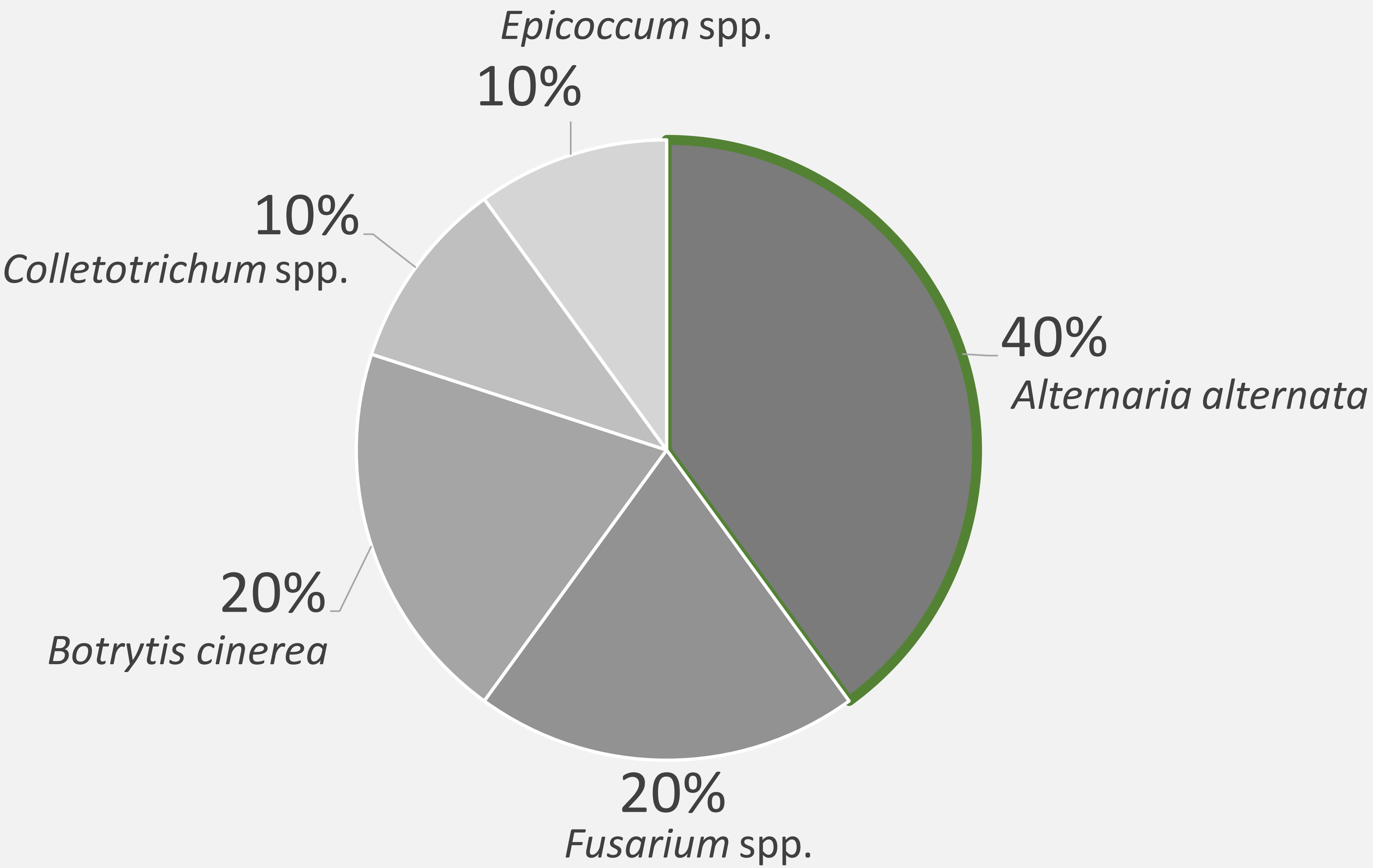
Start with BSc Agric Plant Pathology



2022 Plant Pathology Final Year Mini Research Projects on Blueberries

Sampled Sites:

1. Nurseries
2. Commercial production farms
3. In & out of season packhouses



Blueberry Research Timeline

2019

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2022

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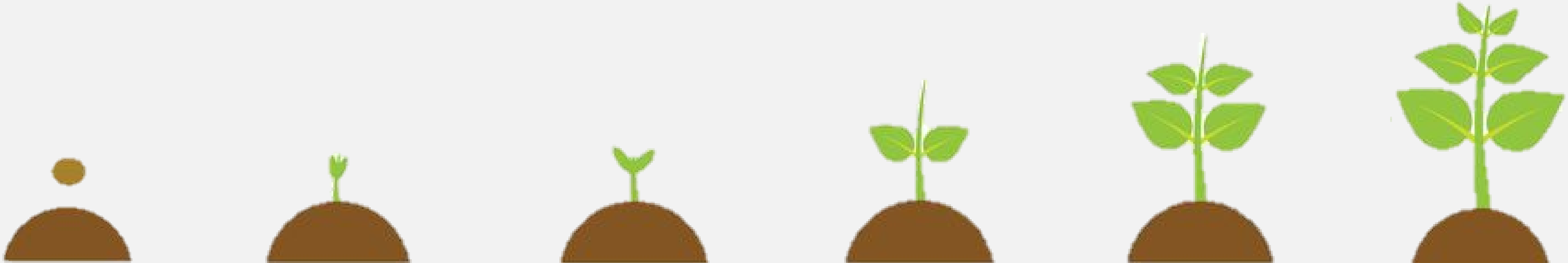
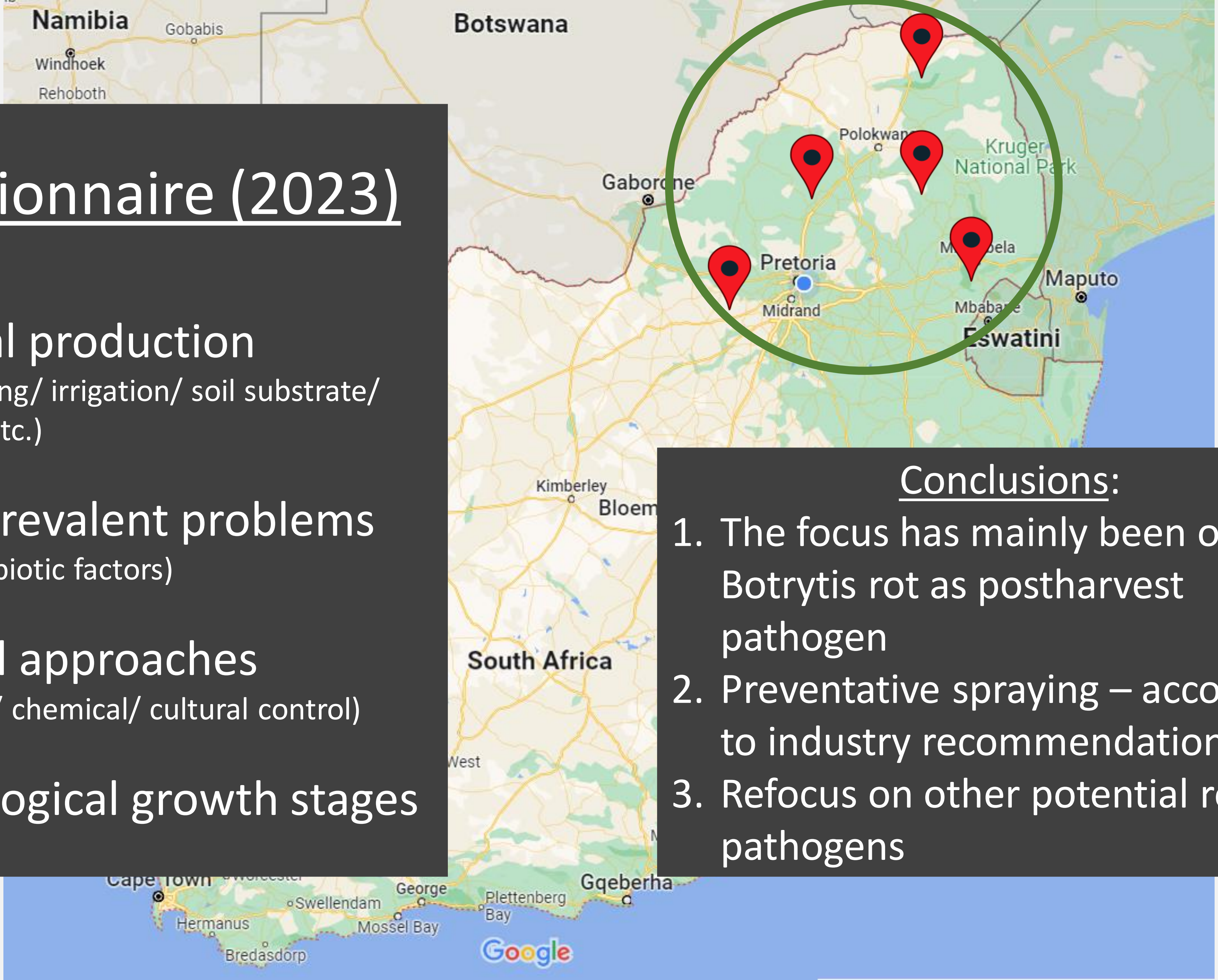
2023

2024





Questionnaire (2023)

1. General production
   (Row spacing/ irrigation/ soil substrate/ fertilizers etc.)

2. Most prevalent problems
   (Biotic & abiotic factors)

3. Control approaches
   (Biological/ chemical/ cultural control)

4. Phenological growth stages

Conclusions:

1. The focus has mainly been on Botrytis rot as postharvest pathogen
2. Preventative spraying – according to industry recommendations
3. Refocus on other potential rot pathogens

Honey bee dissemination of *Bacillus subtilis* to citrus flowers for control of *Alternaria*

BY

MOGALATJANE PATRICK MPHAHLELE

Submitted to the Faculty of Natural and Agricultural Sciences

Department of Microbiology and Plant Pathology

University of Pretoria

In partial fulfillment of the requirements for the degree of

M Inst Agrar (Plant Protection)

December 2003

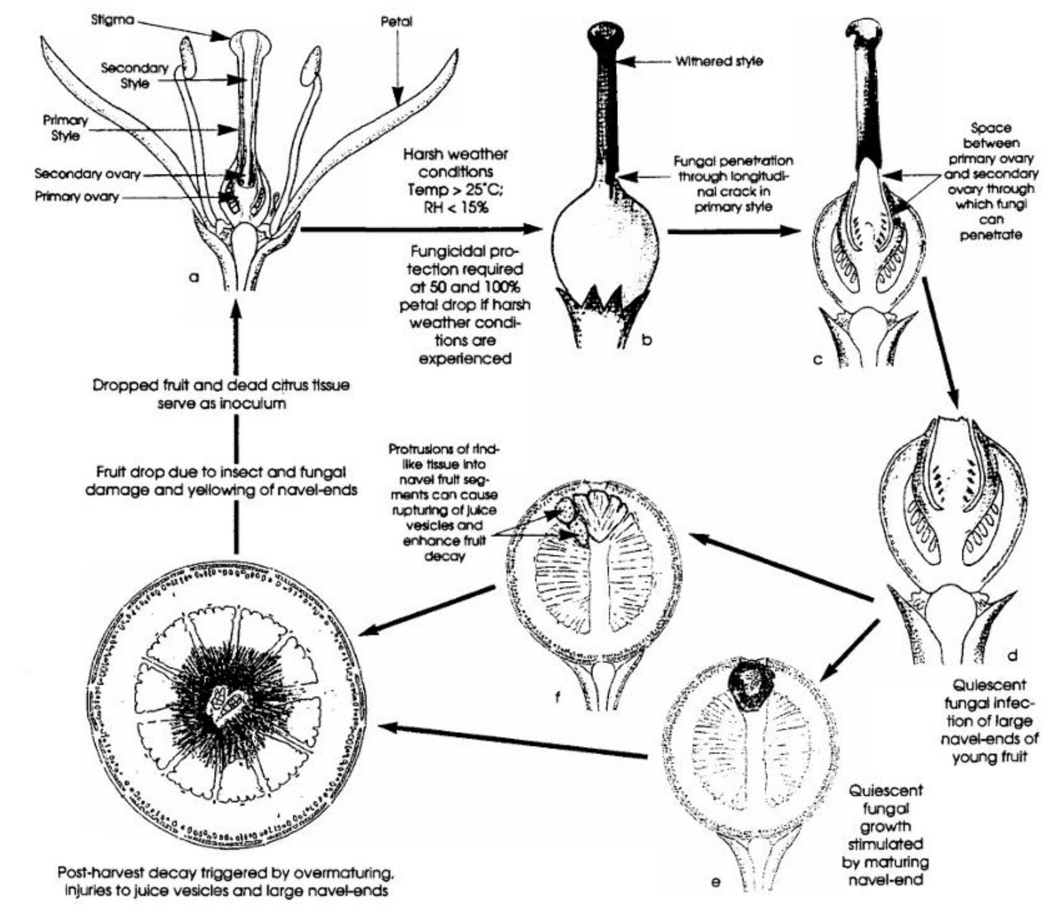
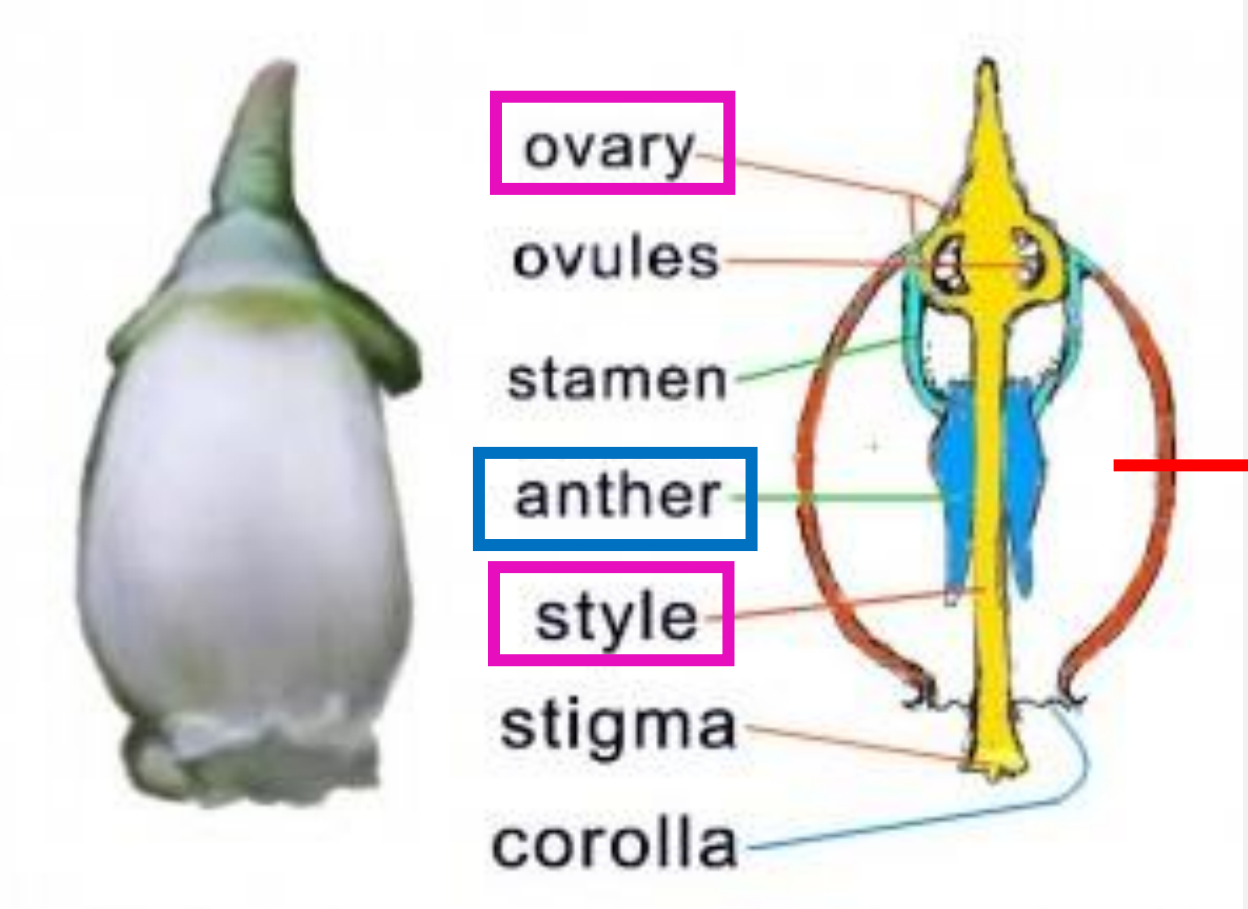
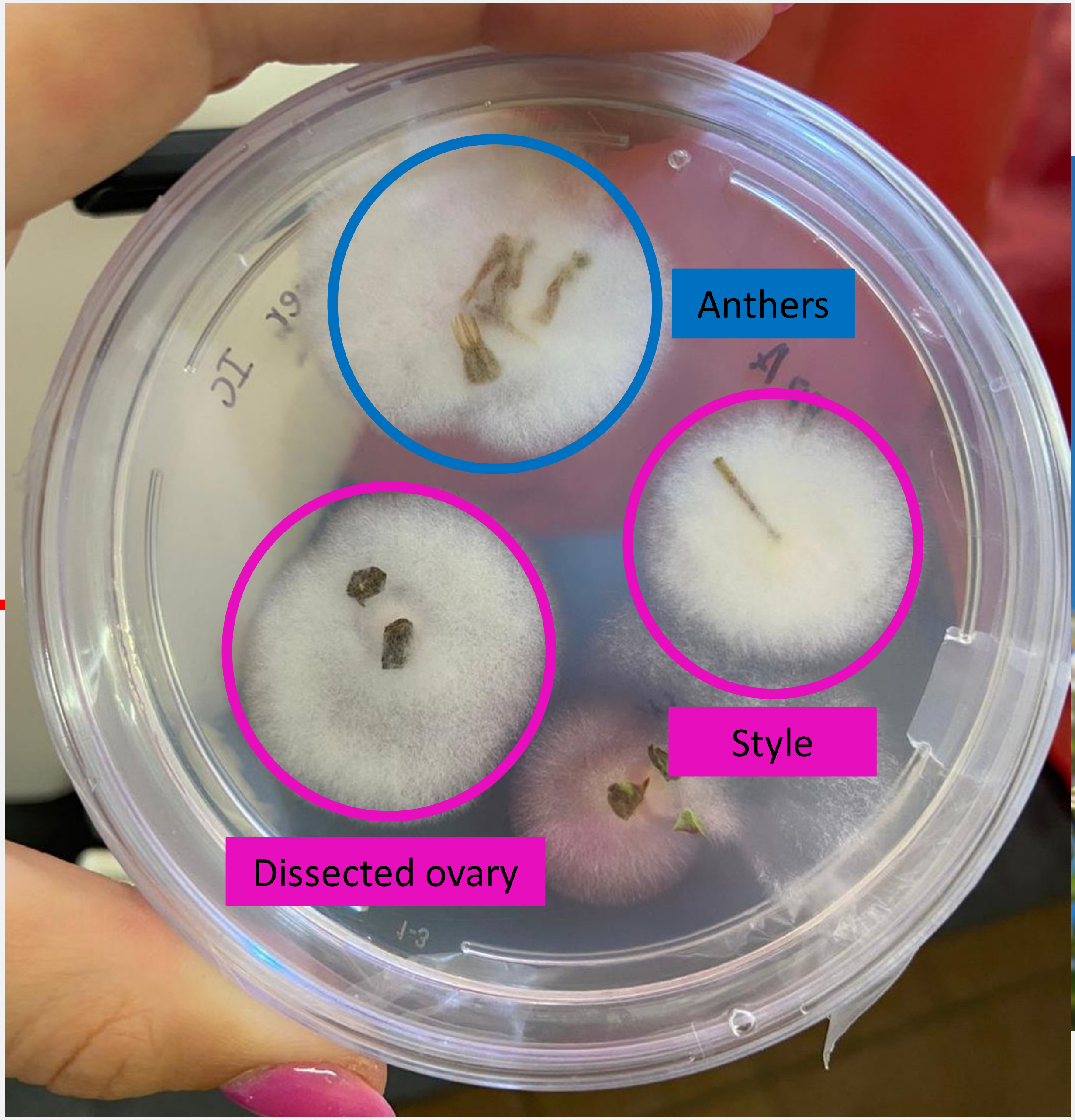


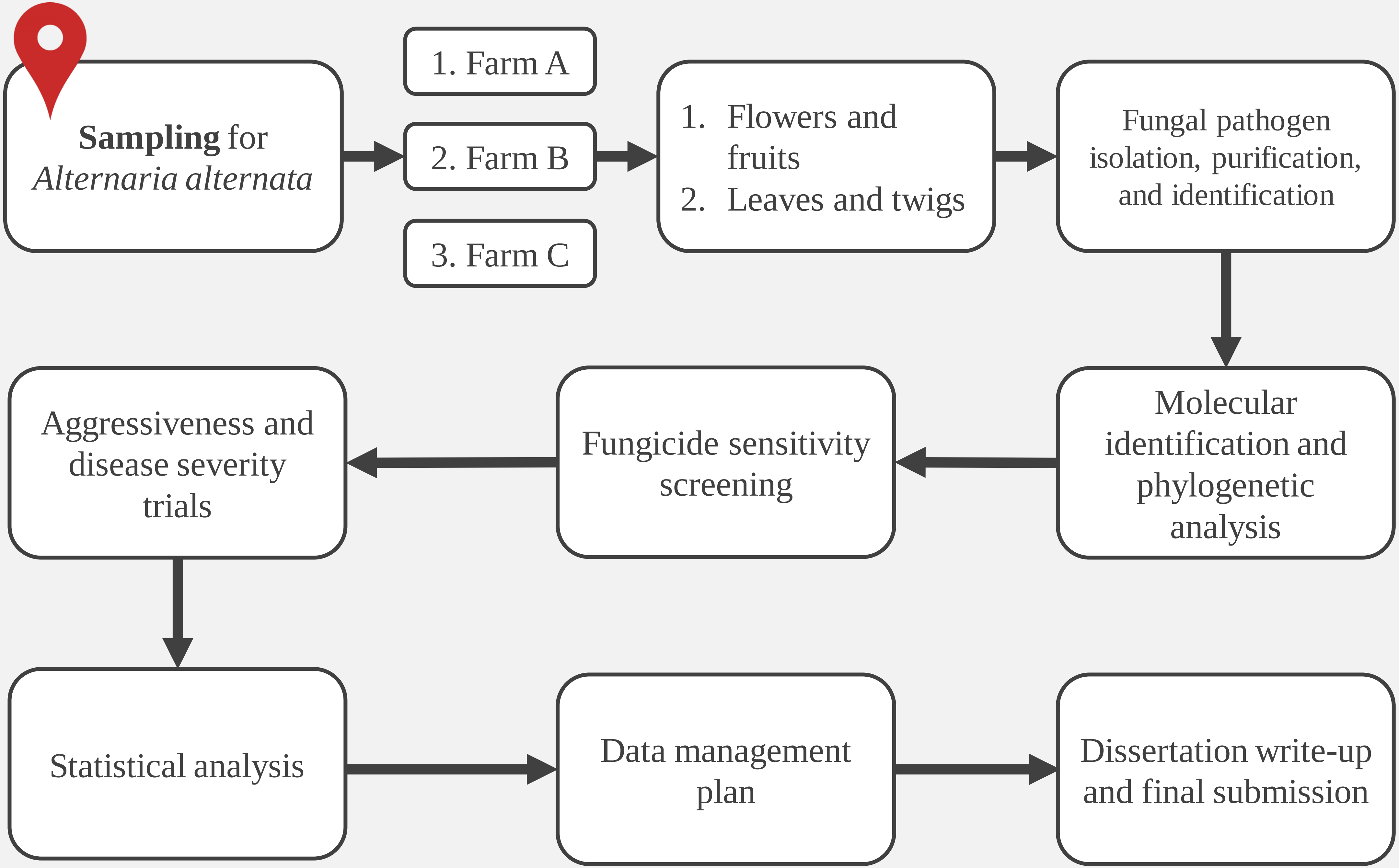
Figure 2.1 Life cycle of *Alternaria* (Schutte *et al.*, 1994).


ovary
ovules
stamen
anther
style
stigma
corolla

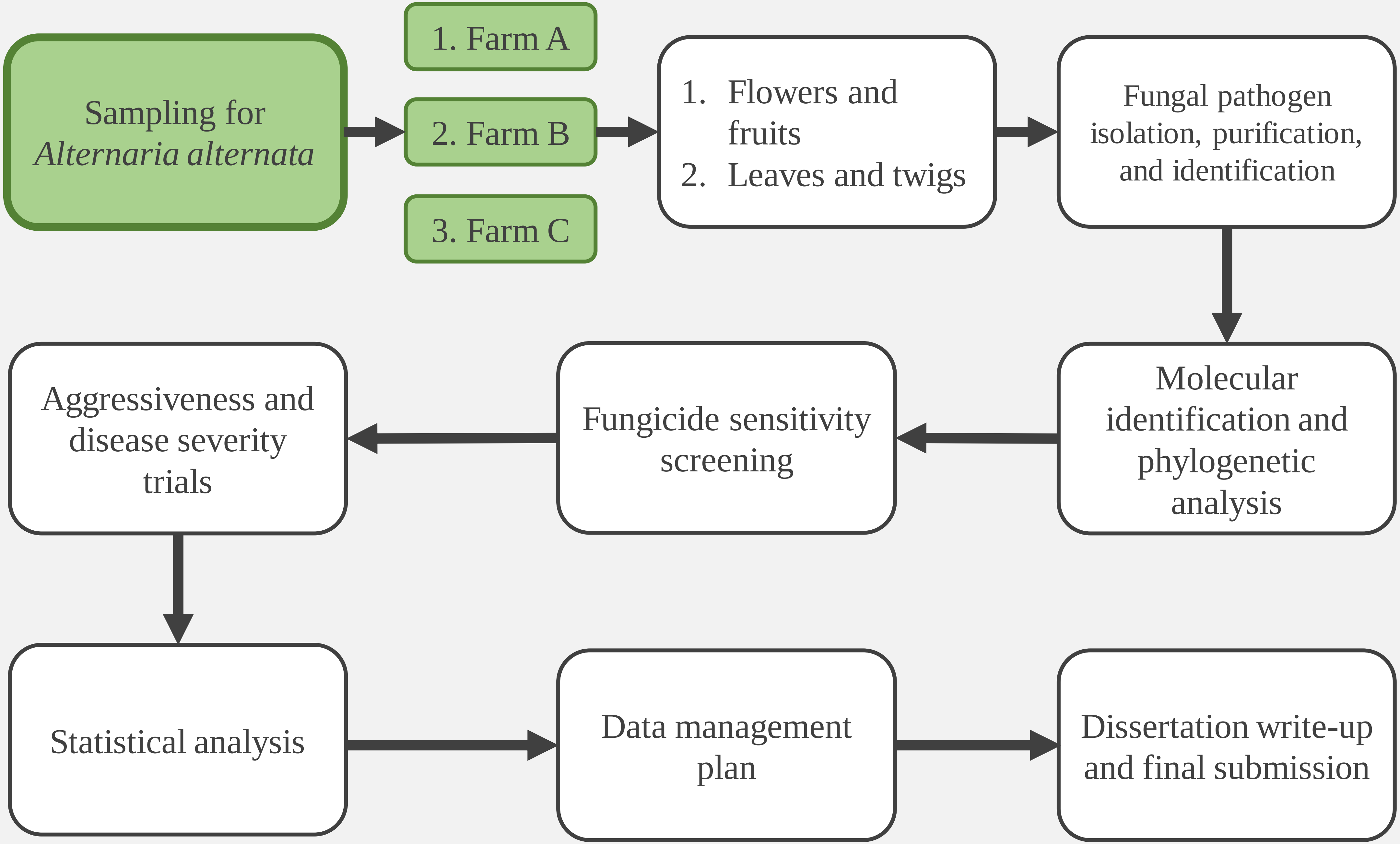

Anthers
Style
Dissected ovary

Aim

To assess the **disease profile and the aggressiveness** of *Alternaria alternata* in northern blueberry production regions of SA and to determine their **sensitivity to fungicides** currently used by the industry.



Sampling for *Alternaria alternata*
1. Farm A
2. Farm B
3. Farm C
1. Flowers and fruits
2. Leaves and twigs
Fungal pathogen isolation, purification, and identification
Molecular identification and phylogenetic analysis
Fungicide sensitivity screening
Aggressiveness and disease severity trials
Statistical analysis
Data management plan
Dissertation write-up and final submission



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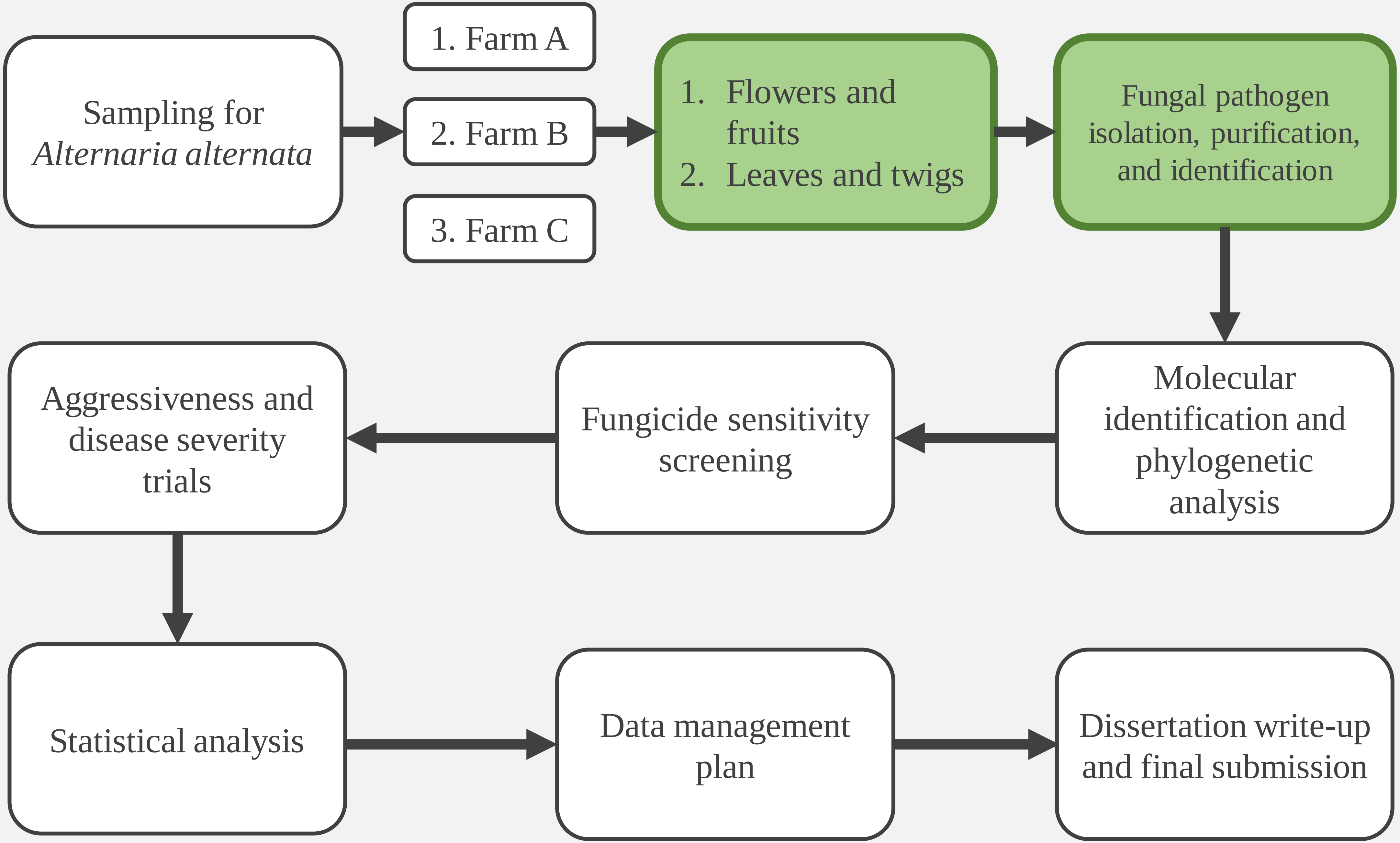
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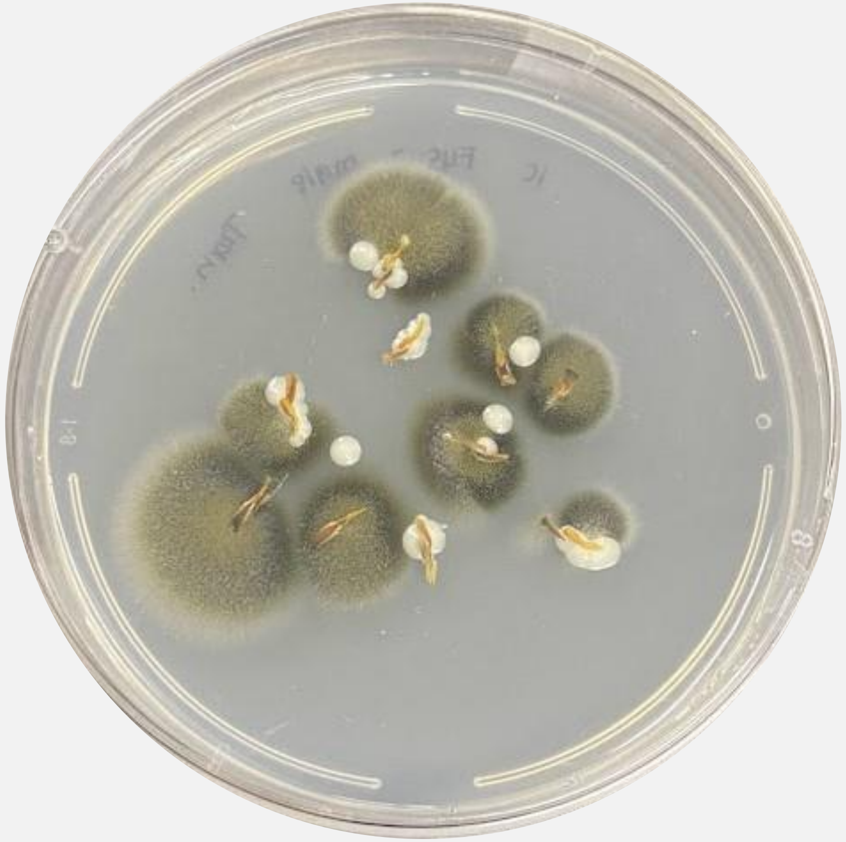
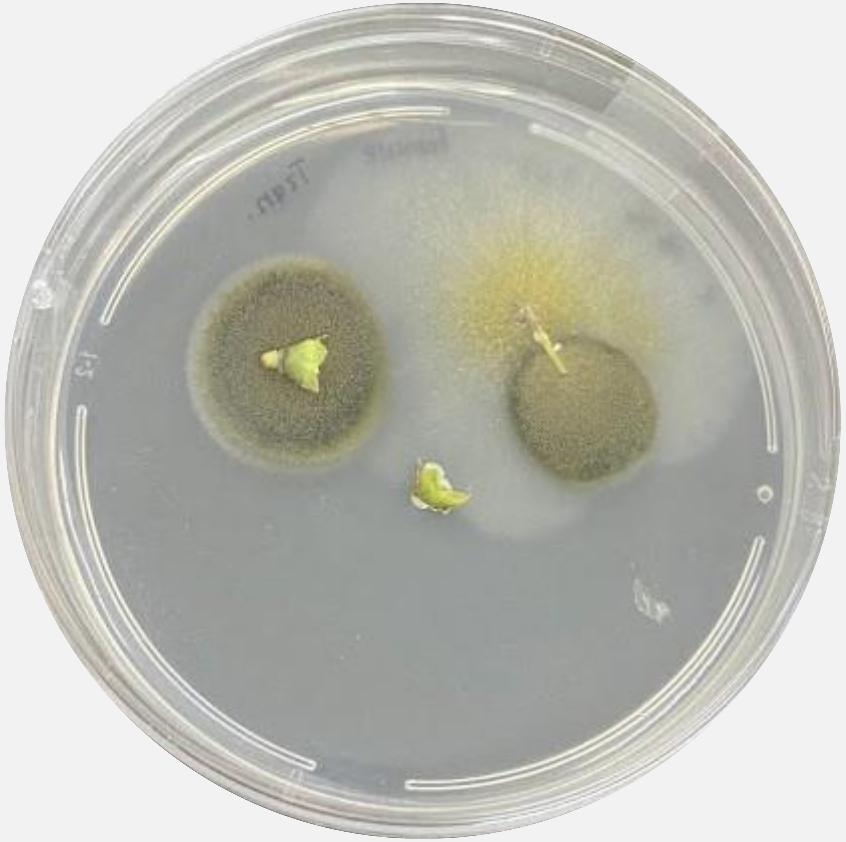
Processing Procedure

Blueberry Flower

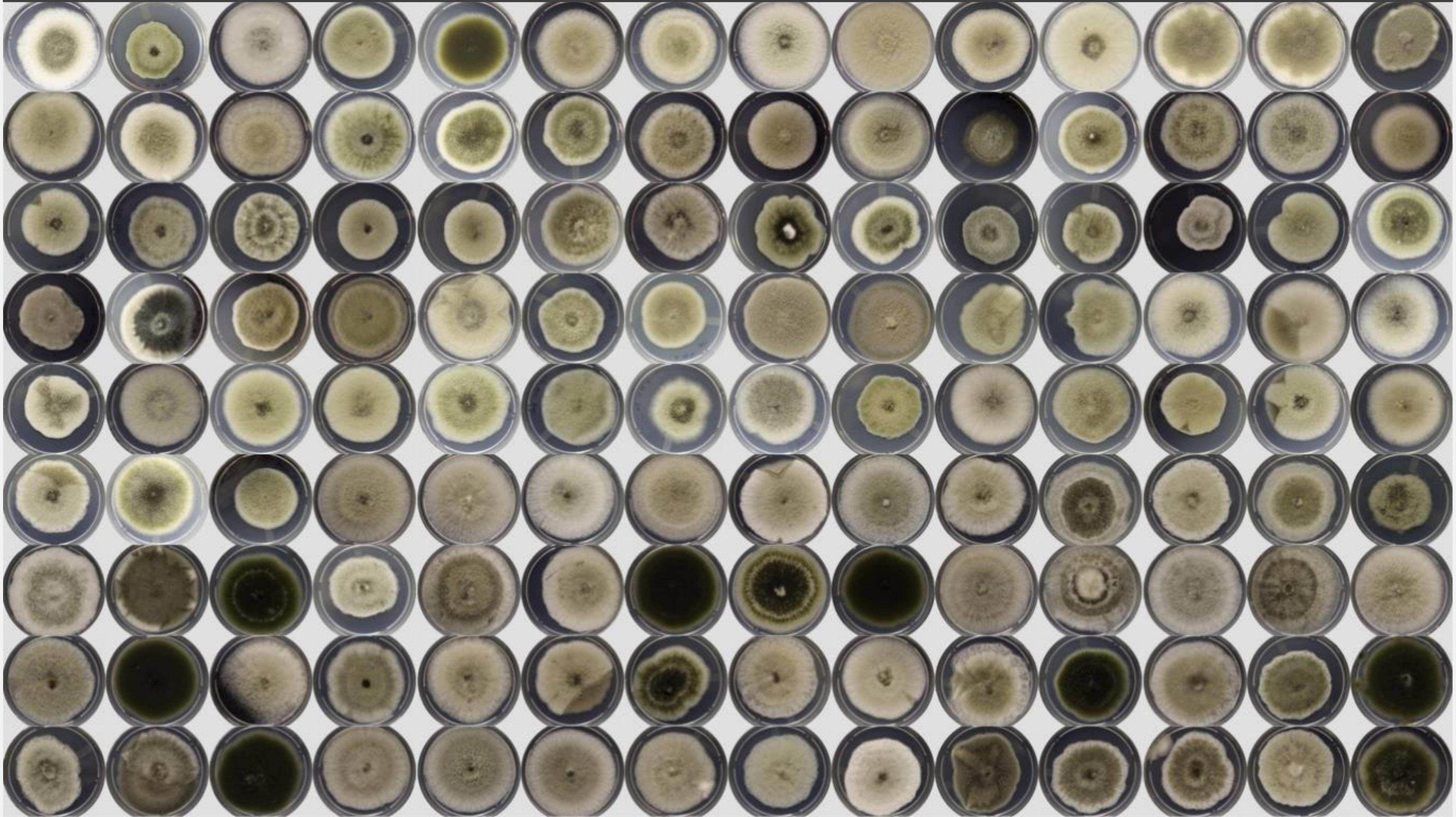
Anthers (male)



Ovary & Style (female)



Morphology of *A. alternata* isolated from blueberry fruits/ leaves/ twigs

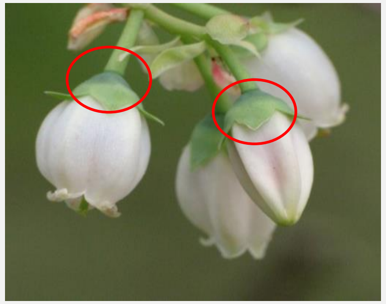


Total number of *A. alternata* isolates			
	Flowers/ Fruit	Leaves	Twigs
Farm A_ Region 1			
1st trip_30 May 2023	24	50	45
2nd trip_ 11 August 2023	14	37	51
Farm B_ Region 2			
1st trip_19 June 2023	6	10	8
2nd trip_ 27 July 2023	33	29	23
Farm C_ Region 3			
1st trip_2 June 2023	37	11	8
2nd trip_ 2 August 2023	23	39	18

*27 plants sampled from per variety

Alternaria spp. Disease cycle

Infection site:
1. Flowers
2. Natural openings
3. Wounds



Primarily an issue when:
1. Fruits overripen on the bushes
2. Damage during harvest
3. When the cold chain gets broken

1. Infection

4. Spread

2. Growth

Spore formation:
1. High relative humidity/ rain
2. Longer leaf-wetting periods

3. Reproduction

Symptoms of berries originate from the calyx cup as berries start to ripen

Spore characteristics:
1. Club-shape spores
2. Form on ripe fruit
3. Germinate @ 20-25°C

Overwinter:
1. Infected canes
2. Old twigs
3. Plant debris/ organic matter

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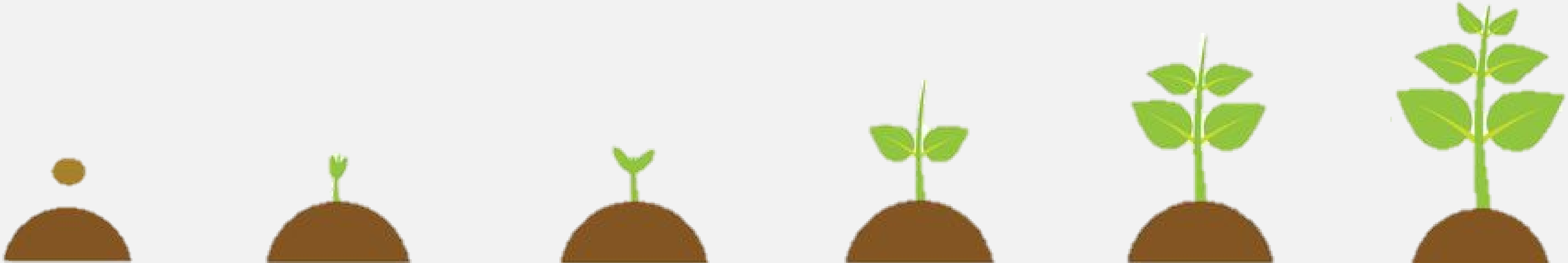
- ✓ ±2000 pure culture isolates
- ✓ ±500 *A. alternata* isolates
- ✓ *A. alternata* is present in northern production regions
- ✓ *A. alternata* can be found on all above-ground plant parts



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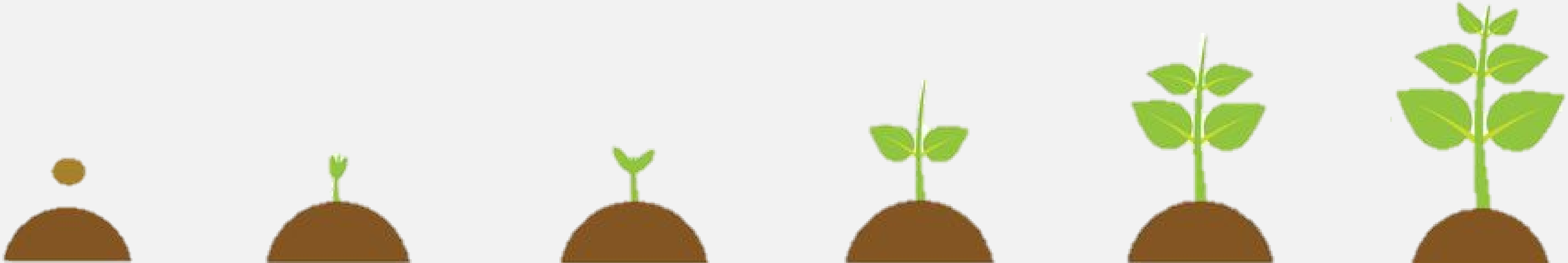
1. **Molecular identification** and **phylogenetic analysis**
2. **Fungicide** sensitivity trials
3. *A. alternata* **aggressiveness** trials



Thank You

For more information, please contact us:

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072 241 6467

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