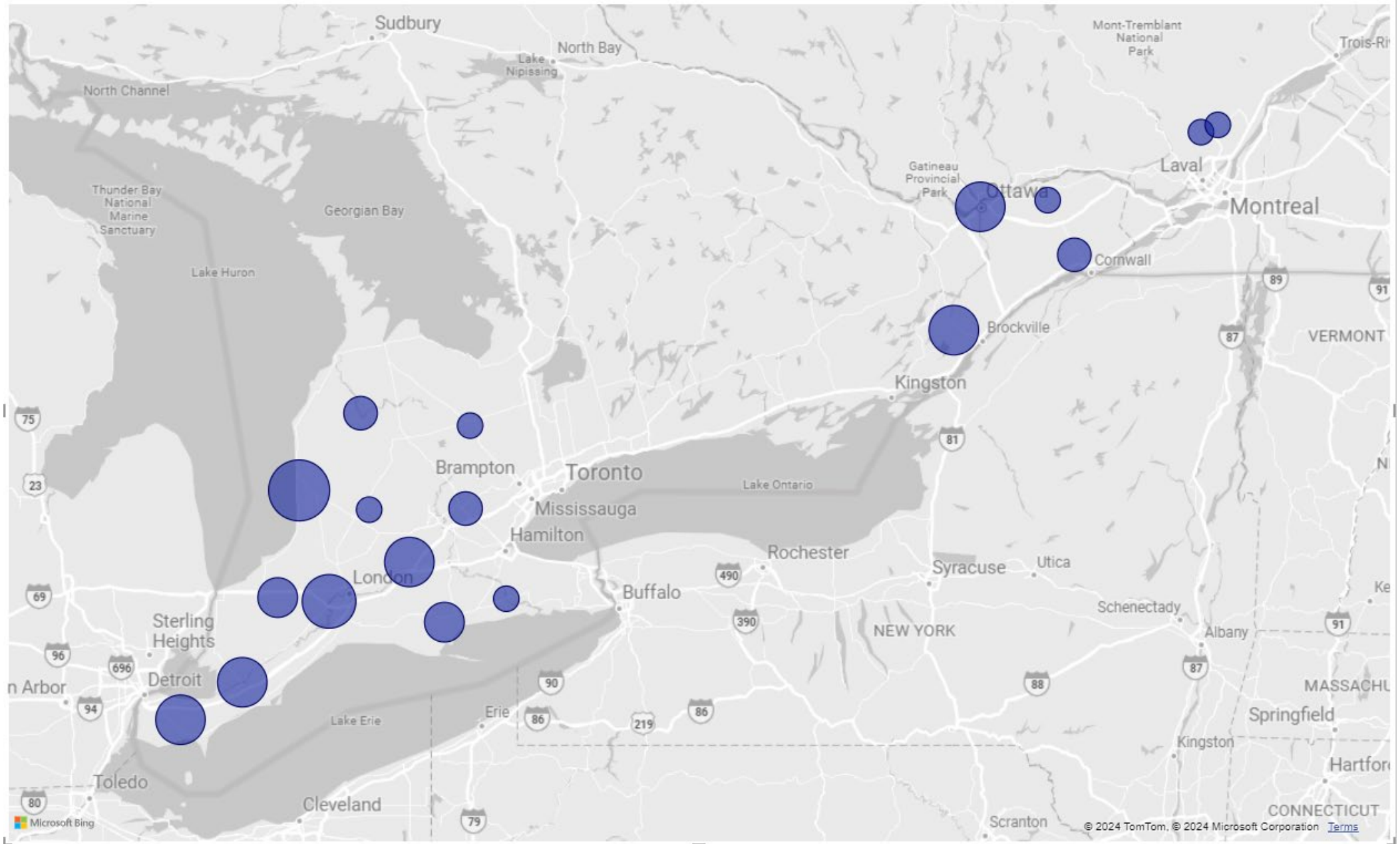
Summary of Molecular Based Herbicide Resistance and Plant ID testing – 2024

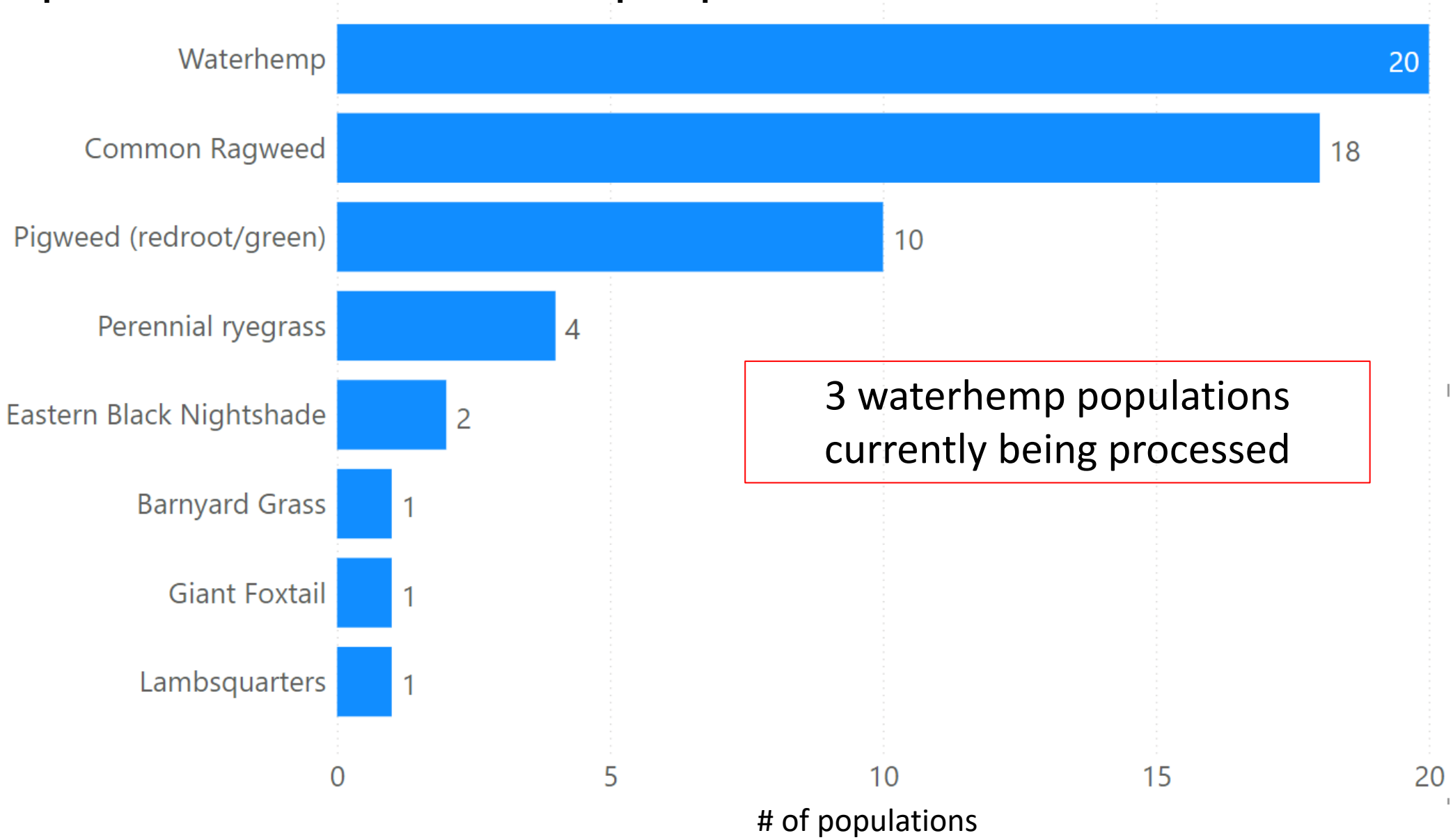
Mike Cowbrough, Kristen Obeid - OMAFA

Financial support provided by:

Areas that submitted weed populations for testing

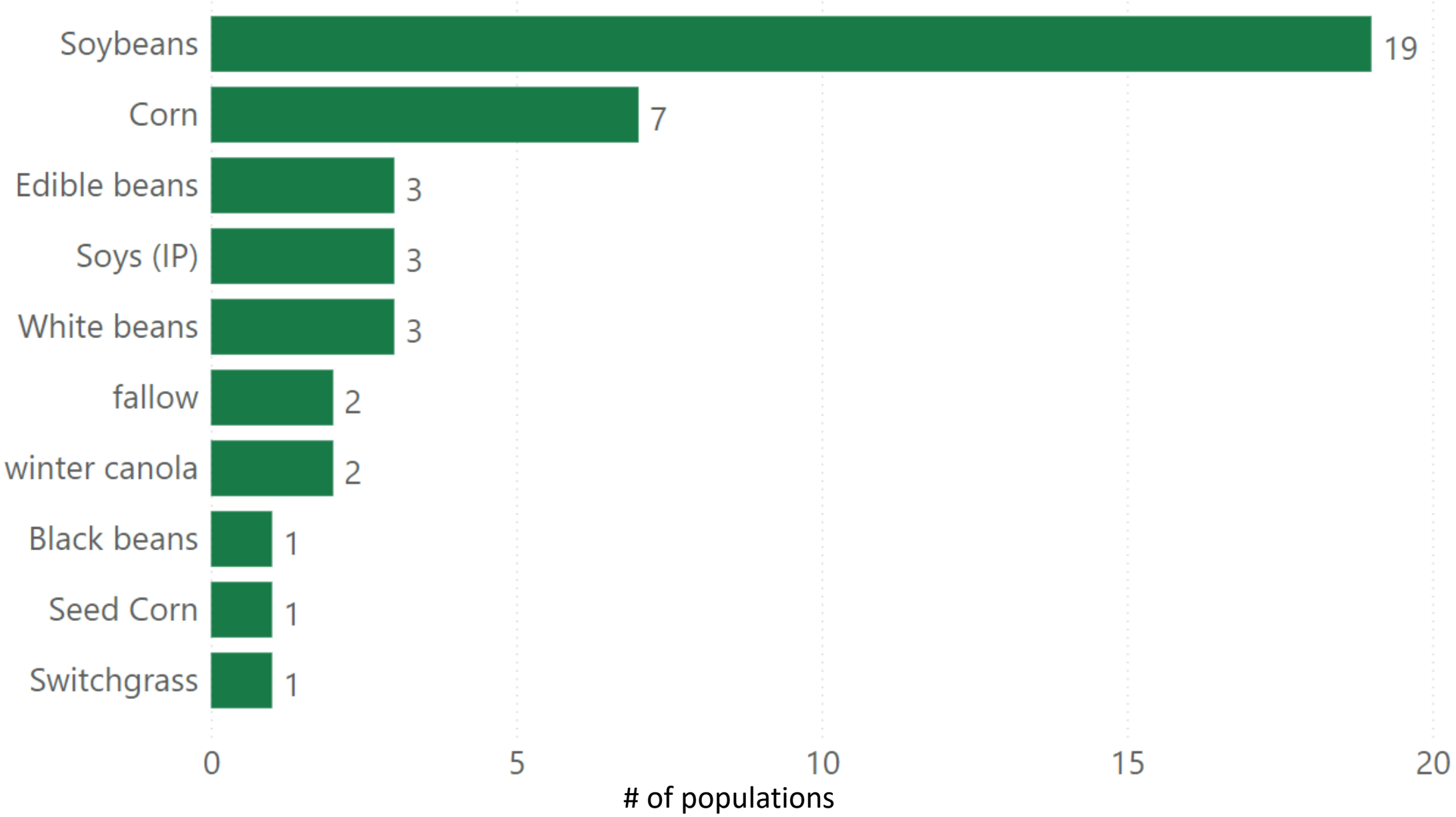


Species tested: 57 populations

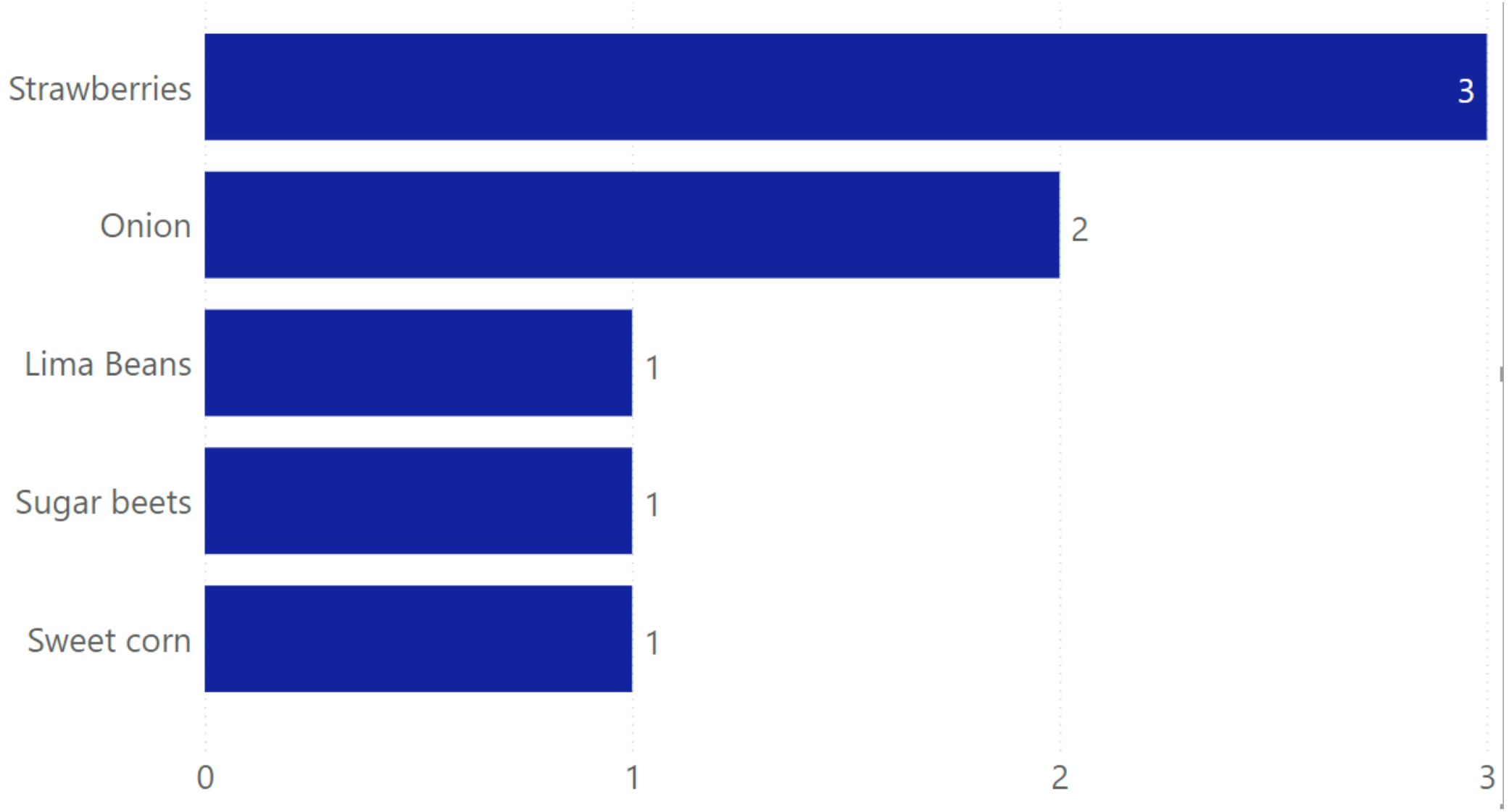


3 waterhemp populations currently being processed

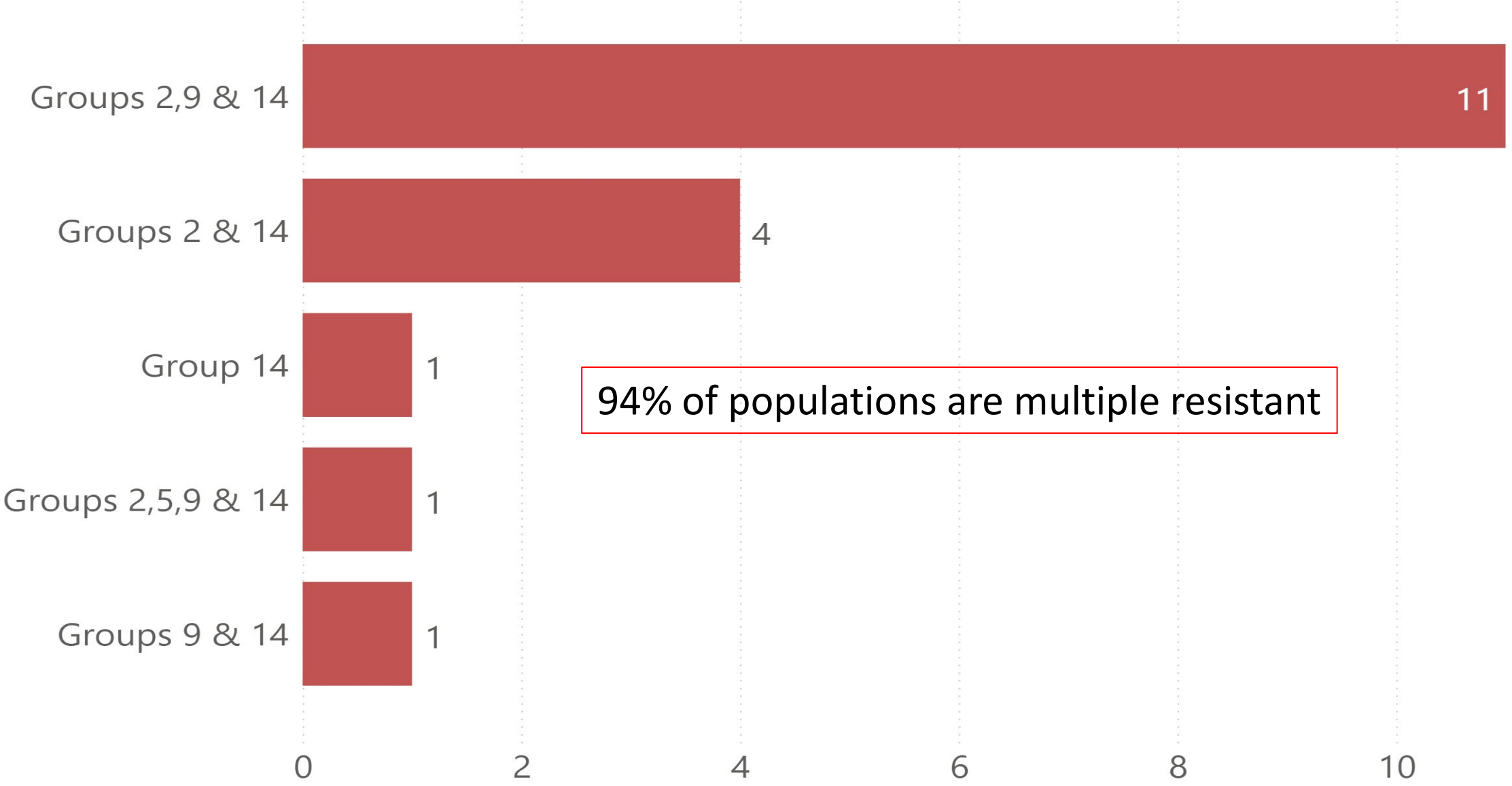
Populations tested – field crops



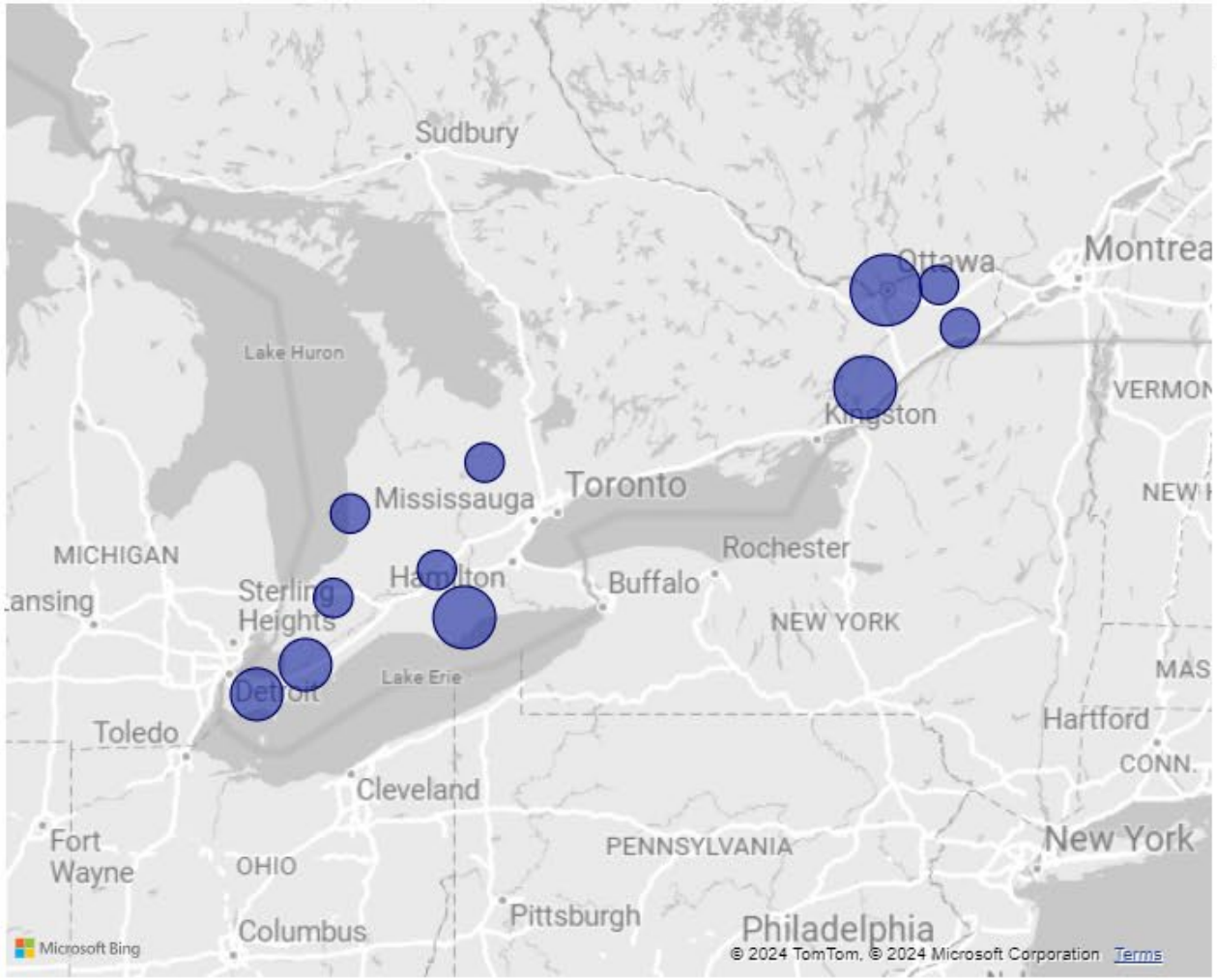
Populations tested – hort crops



Waterhemp – all populations (pops) were resistant



94% of populations are multiple resistant


Sudbury
Ottawa
Montrea
Lake Huron
VERMON
Kingston
Toronto
Mississauga
NEW
MICHIGAN
Rochester
Buffalo
Sterling Heights
NEW YORK
Lake Erie
MAS
Toledo
Hartford
CONN.
Cleveland
Fort Wayne
OHIO
PENNSYLVANIA
New York
Columbus
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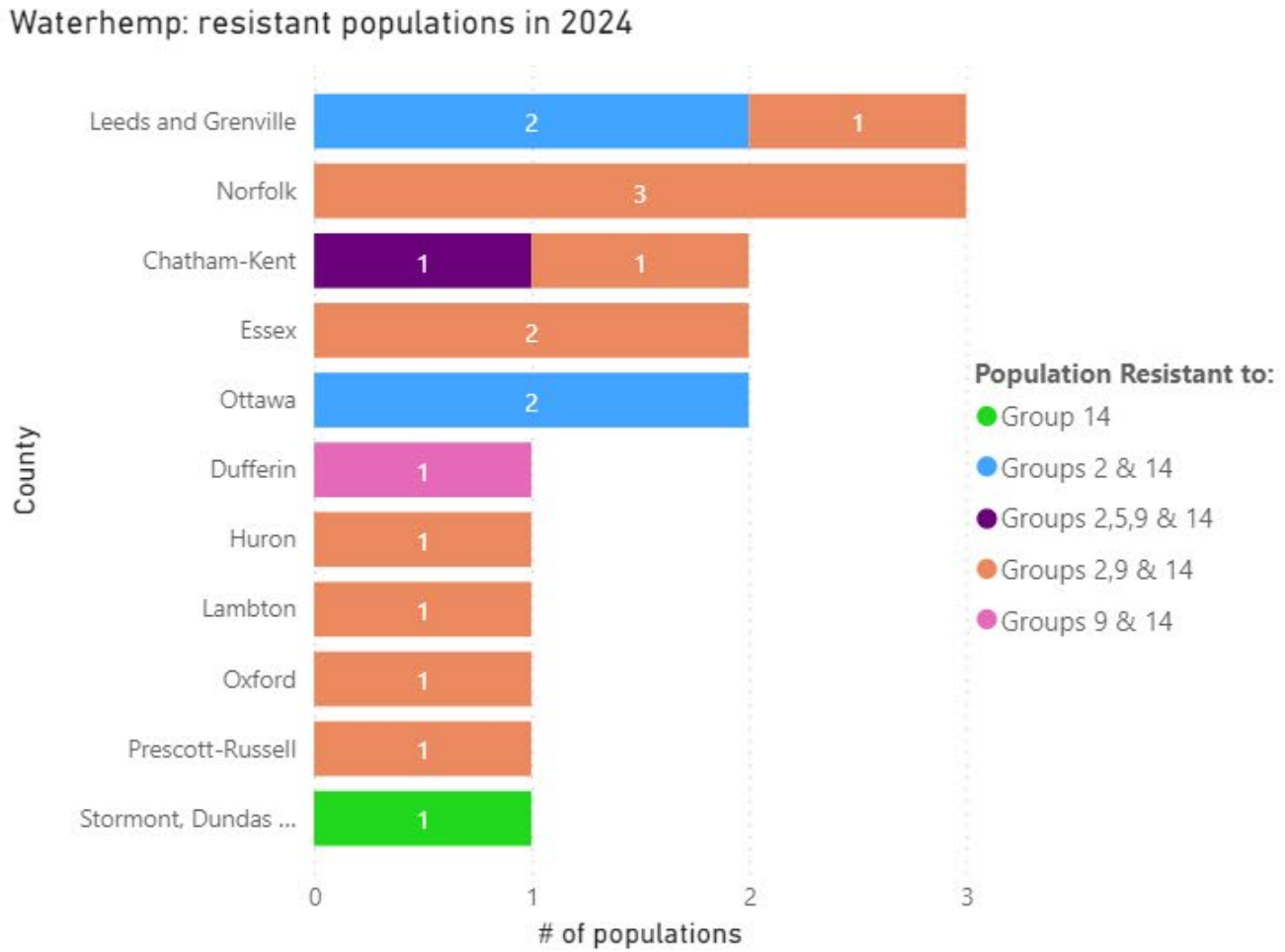
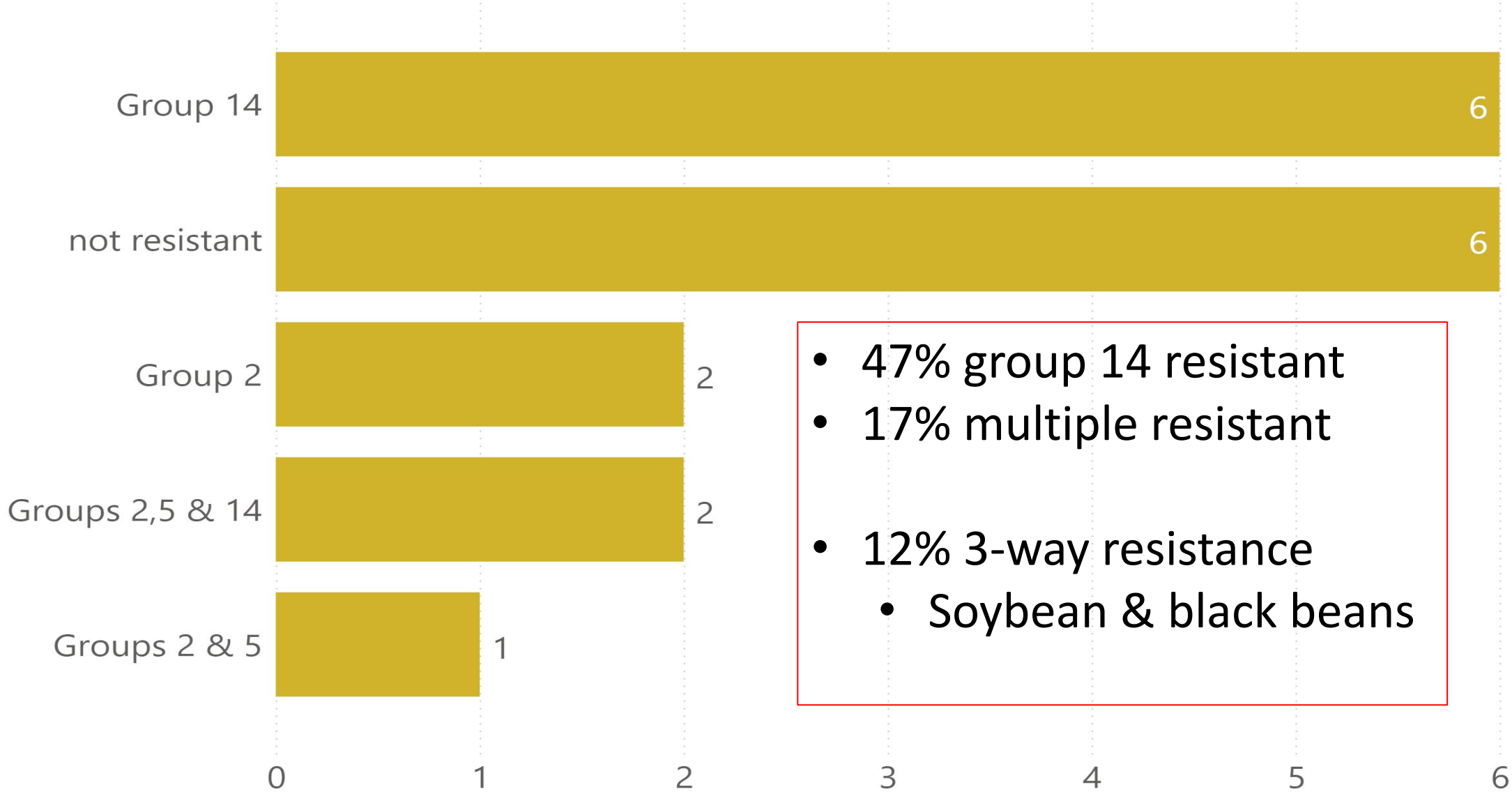
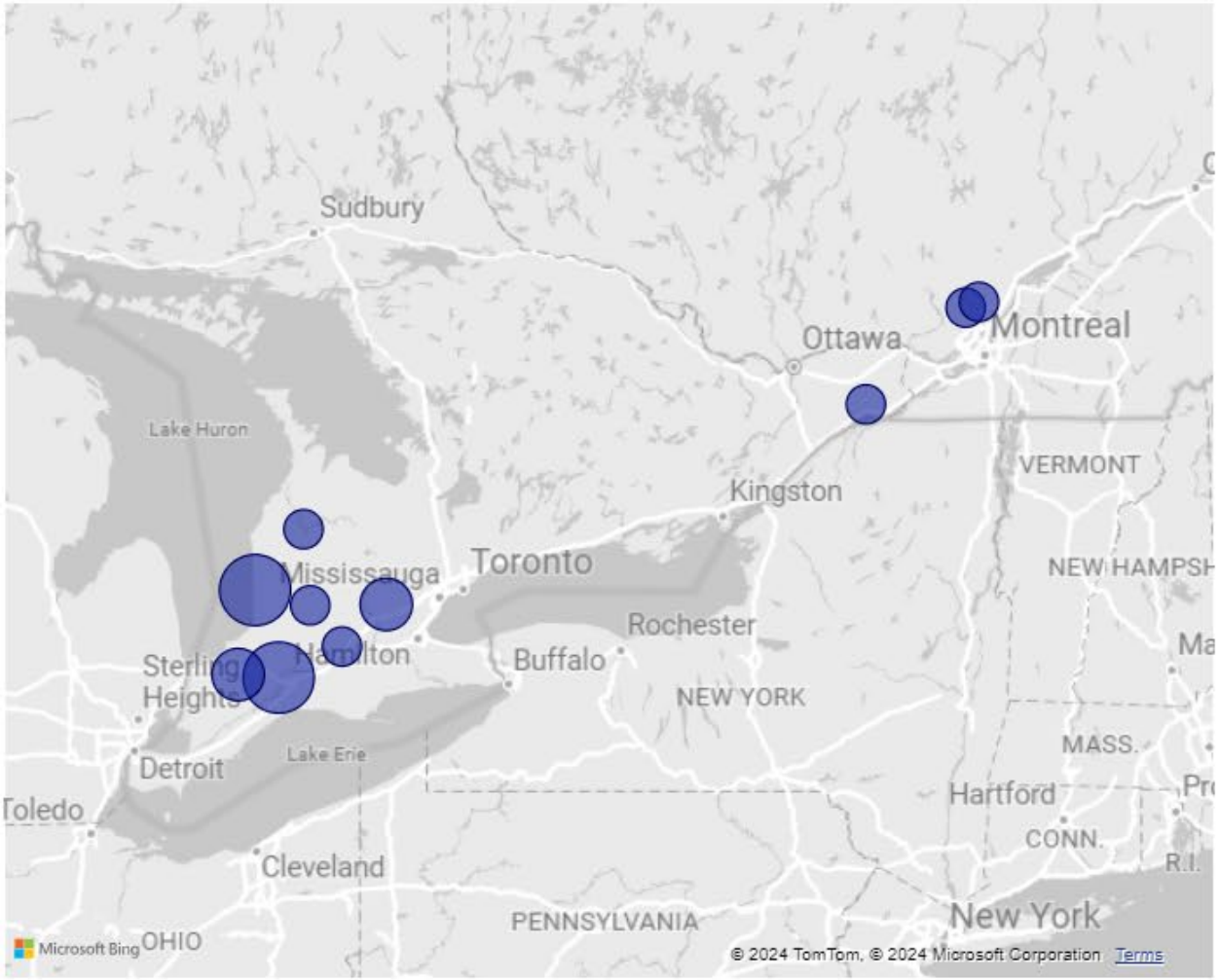

Waterhemp: resistant populations in 2024
County
Leeds and Grenville
Norfolk
Chatham-Kent
Essex
Ottawa
Dufferin
Huron
Lambton
Oxford
Prescott-Russell
Stormont, Dundas ...
2
1
3
1
1
2
2
1
1
1
1
1
1
0
1
2
3
# of populations
Population Resistant to:
Group 14
Groups 2 & 14
Groups 2,5,9 & 14
Groups 2,9 & 14
Groups 9 & 14

Common ragweed: 65% of pops were resistant



- 47% group 14 resistant
- 17% multiple resistant

- 12% 3-way resistance
  - Soybean & black beans


Sudbury
Ottawa
Montreal
Lake Huron
VERMONT
Kingston
Toronto
Mississauga
NEW HAMPSH
Rochester
Buffalo
Sterling Heights
NEW YORK
Detroit
Lake Erie
MASS.
Hartford
Toledo
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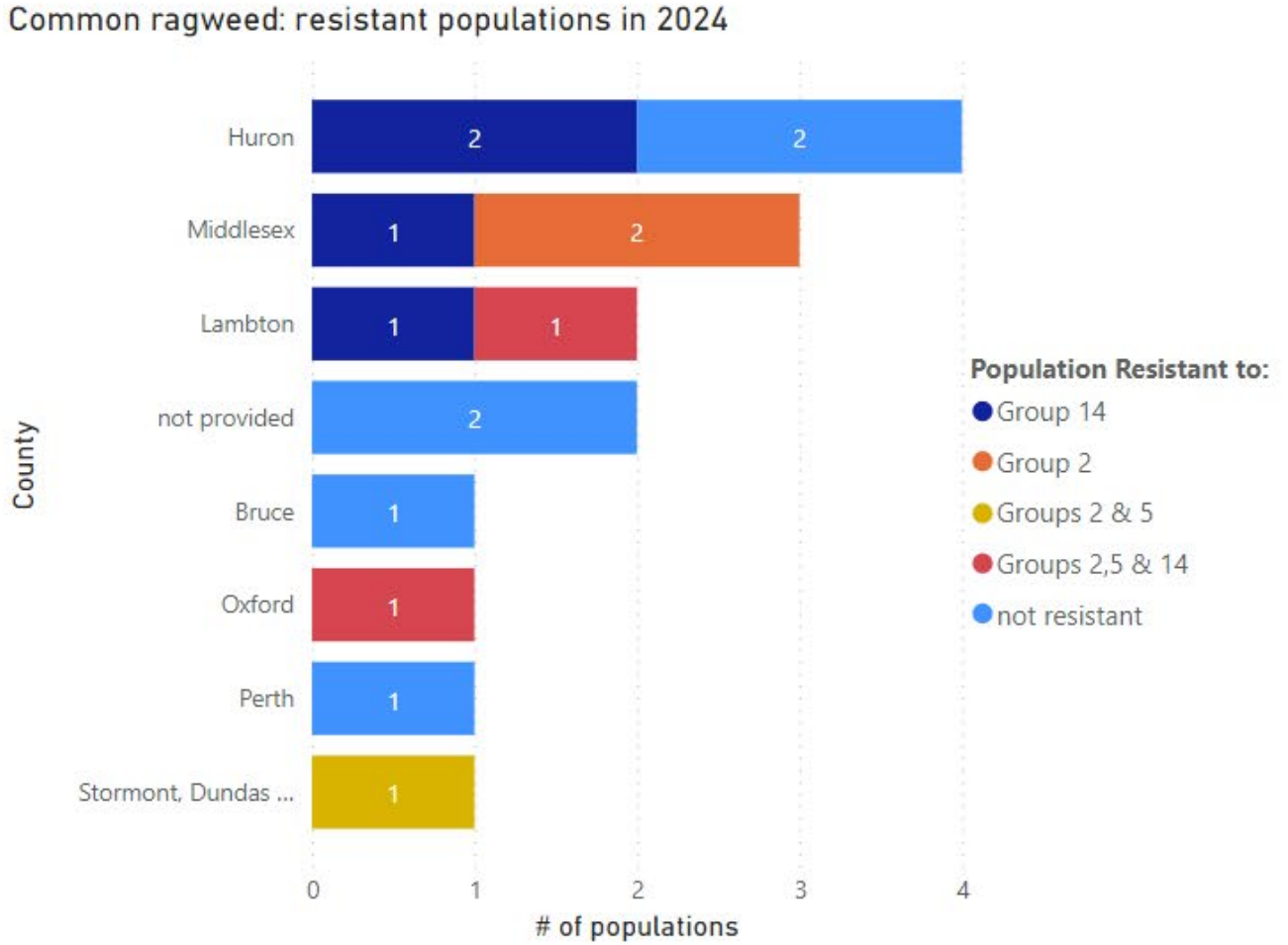
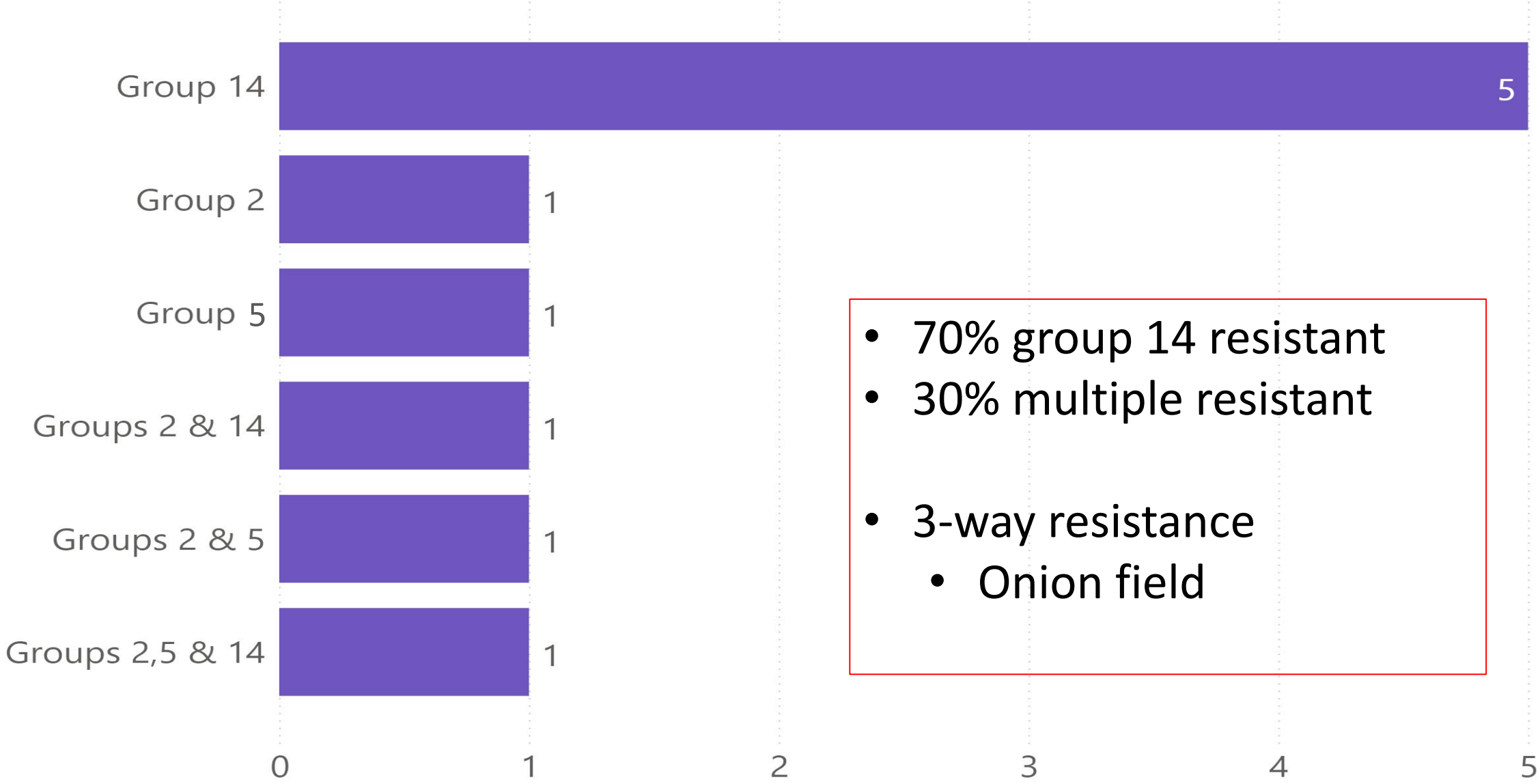
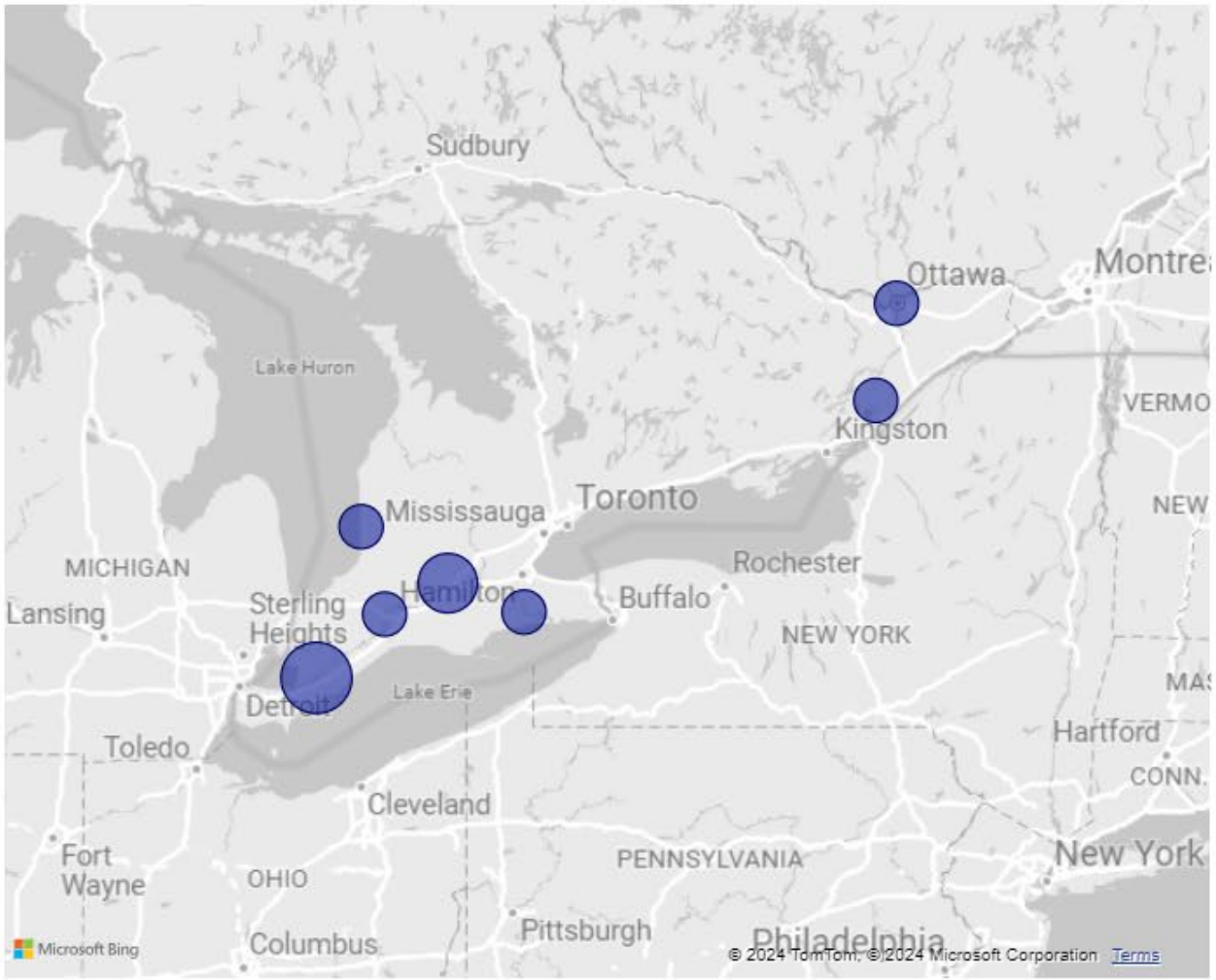

Common ragweed: resistant populations in 2024
County
Huron
Middlesex
Lambton
not provided
Bruce
Oxford
Perth
Stormont, Dundas ...
2
2
1
2
1
1
2
1
1
1
1
0
1
2
3
4
# of populations
Population Resistant to:
Group 14
Group 2
Groups 2 & 5
Groups 2,5 & 14
not resistant

Pigweed (redroot/green): all pops resistant



- 70% group 14 resistant
- 30% multiple resistant

- 3-way resistance
  - Onion field


Sudbury
Ottawa
Montre
Lake Huron
VERMO
Kingston
Toronto
Mississauga
NEW
MICHIGAN
Rochester
Hamilton
Buffalo
Lansing
Sterling Heights
NEW YORK
Lake Erie
Detroit
MAS
Hartford
Toledo
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Cleveland
Fort Wayne
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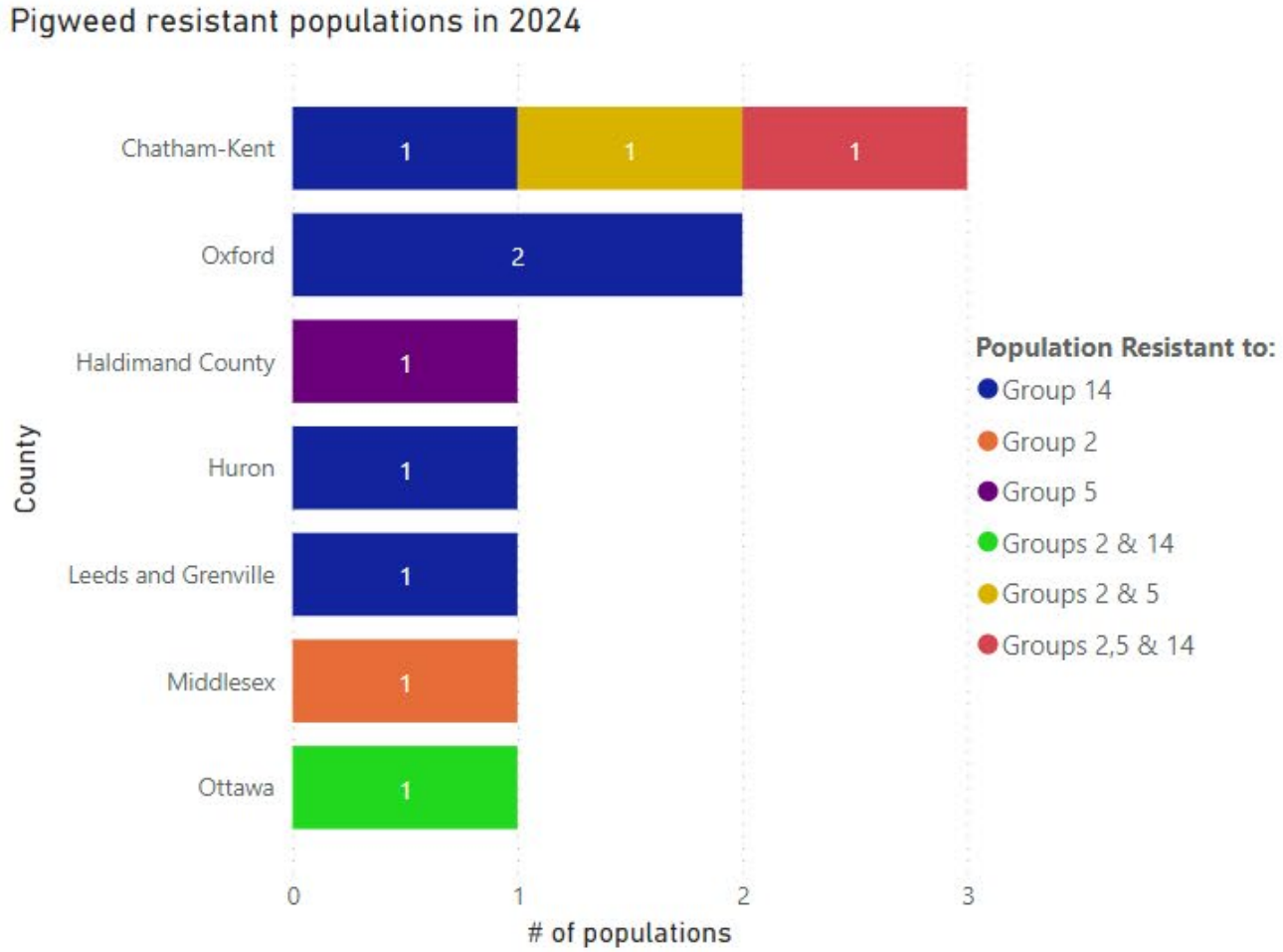
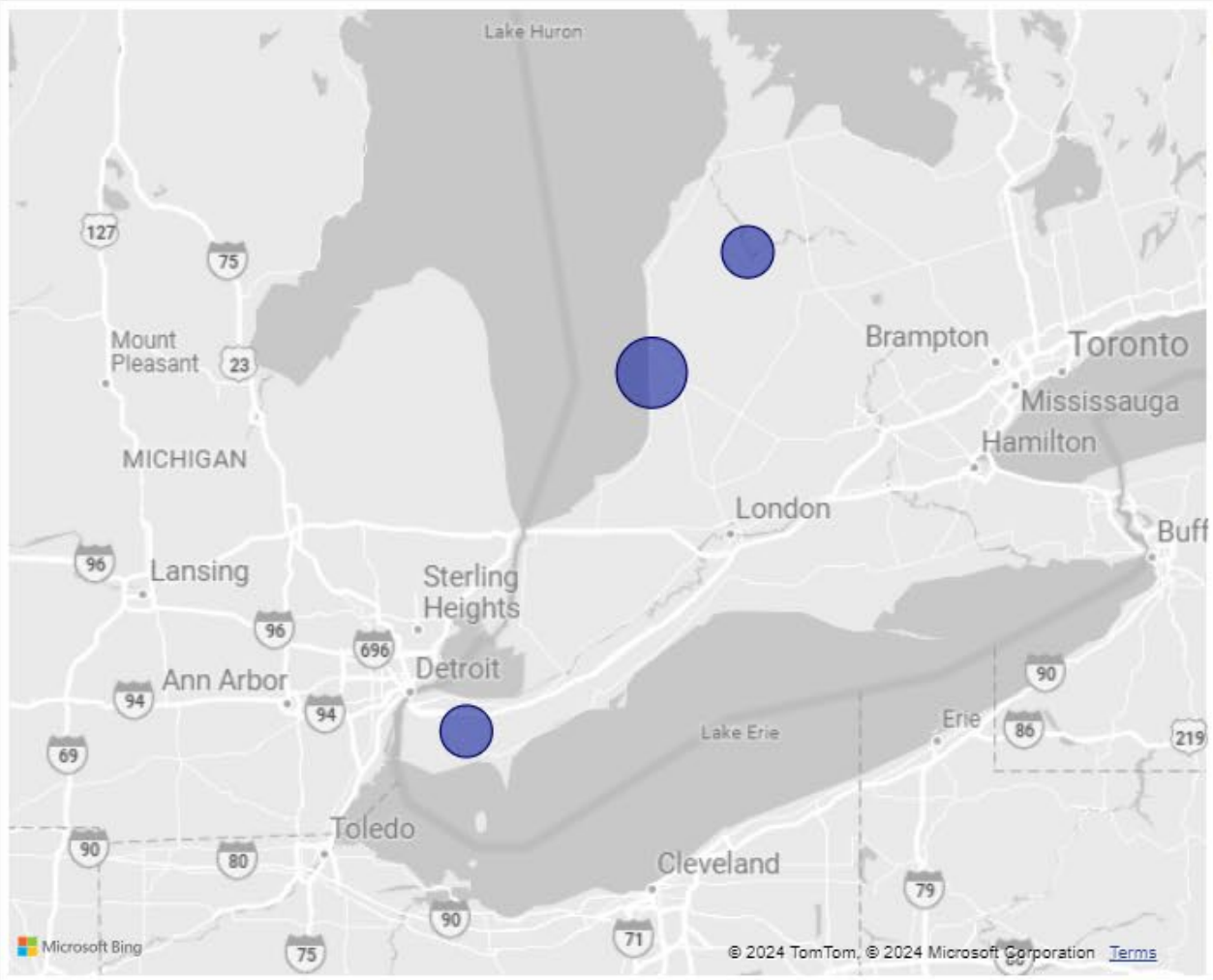

Pigweed resistant populations in 2024
Chatham-Kent
Oxford
Haldimand County
Huron
Leeds and Grenville
Middlesex
Ottawa
1
1
1
2
1
1
1
1
1
County
0
1
2
3
# of populations
Population Resistant to:
Group 14
Group 2
Group 5
Groups 2 & 14
Groups 2 & 5
Groups 2,5 & 14

Perennial ryegrass

- All pops were glyphosate resistant


Lake Huron
Mount Pleasant
MICHIGAN
Brampton
Toronto
Mississauga
Hamilton
London
Buff
Lansing
Sterling Heights
Detroit
Ann Arbor
Lake Erie
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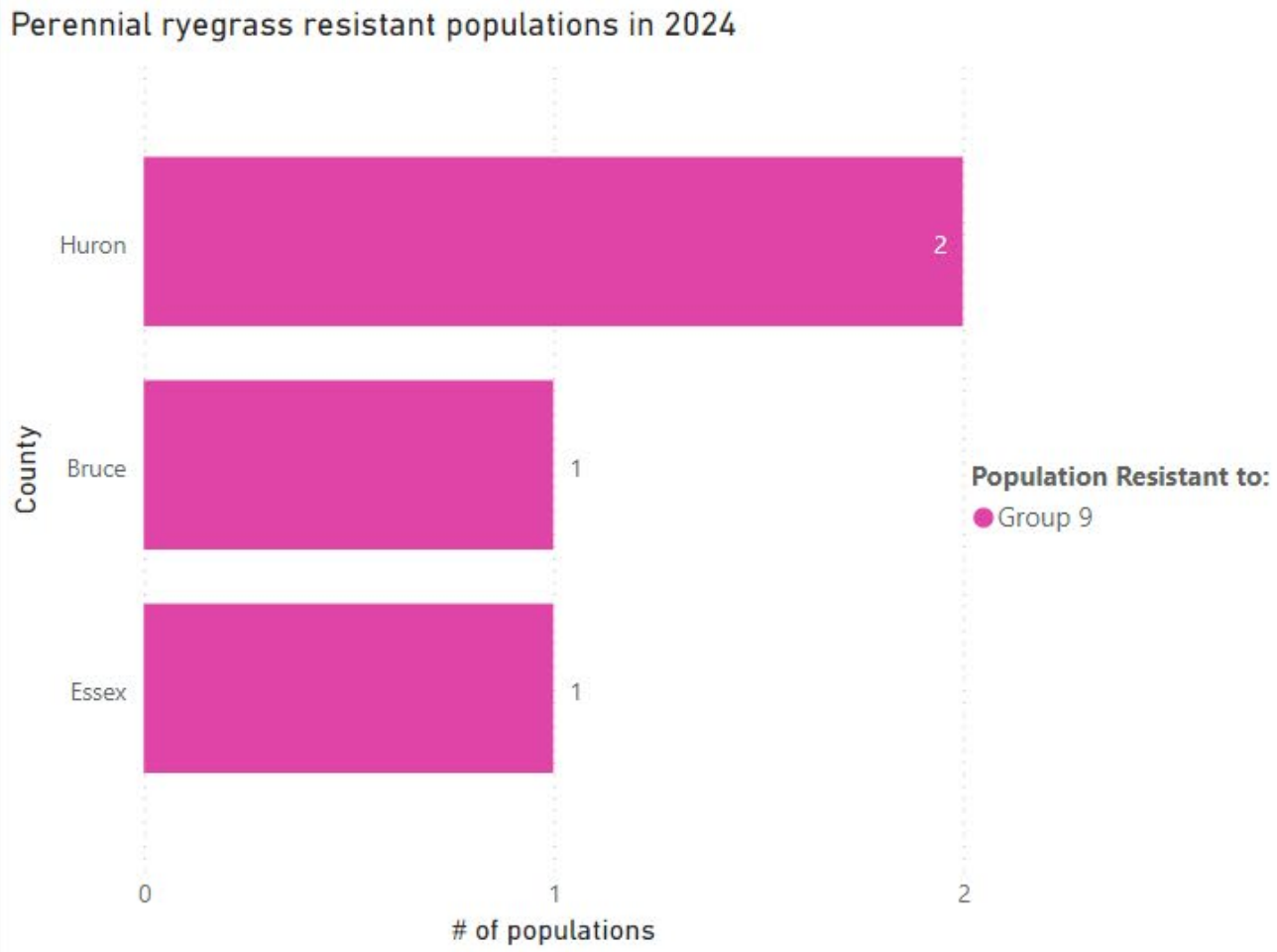
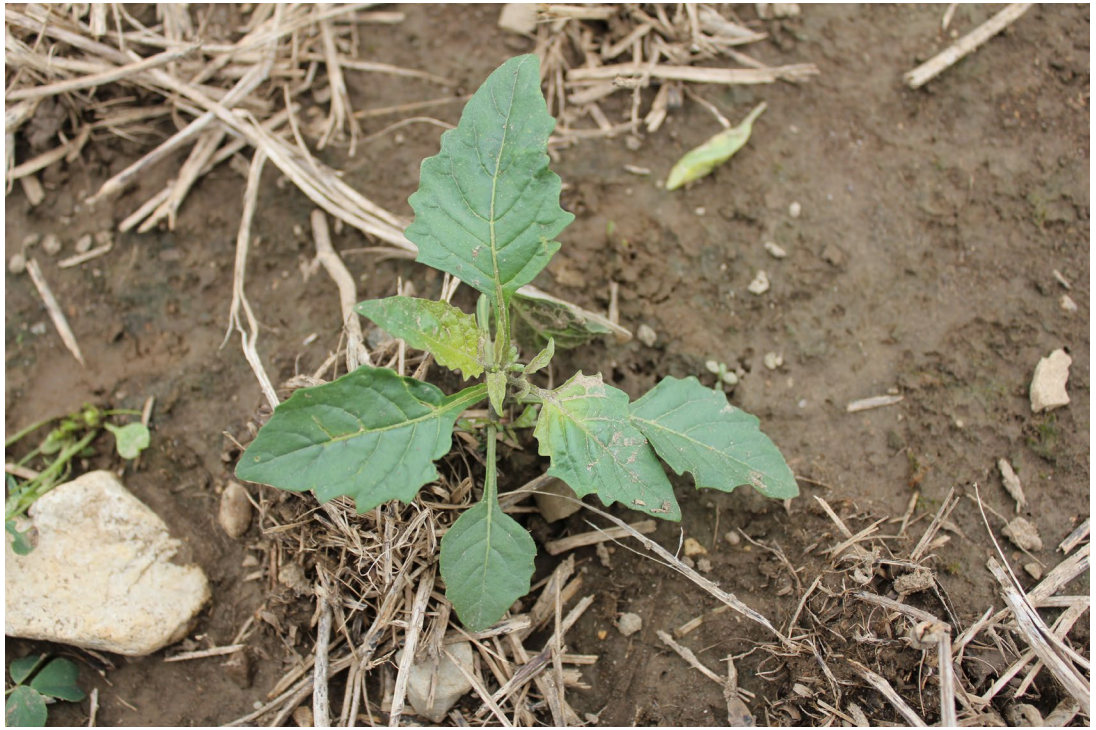

Perennial ryegrass resistant populations in 2024
County
Huron
Bruce
Essex
2
1
1
0
1
2
# of populations
Population Resistant to:
Group 9

Eastern Black Nightshade

- 2 populations were resistant to imazethapyr (group 2)
- Middlesex and Oxford



Lambsquarter: 50% of pops resistant

- 1 population was resistant to triazine herbicides (group 5)
- Leeds and Grenville

Species identification - Grasses

Species	County
Loose silky bentgrass	Wellington
Perennial ryegrass	Bruce, Essex, Huron, Wellington
Sheep’s fescue	Prince Edward County
Wild rye (*Elymus*)	Wellington
Roughstalk bluegrass	Wellington
Southern crabgrass	Essex

Species identification – Broadleaf weeds

Species	County
Palmer amaranth	Bruce, Haldimand
Waterhemp	Essex, Huron, Norfolk, Prescott-Russell
Green pigweed	Huron
Lambsquarters	Wellington
Common ragweed	Oxford
Redroot pigweed	Chatham-Kent, Essex
Groundcherry (Physallis spp.)	Huron

Limitations

- If the mechanism of resistance of a species is not a target site mutation with a molecular test, then resistance won't be detected
  - Could results in false negatives
    - e.g. group 5 resistance in waterhemp
      - Dose response tests have shown high % of atrazine resistance
      - Molecular testing has rarely indicated group 5 resistant in 2024 sampling.
      - Best practice is to also do dose response test via Tardif lab.

Challenges

- Testing costs have increased by 40%