

Healthy Soils, Healthy Farms, Healthy Environment (H-3) Project

East Central Region Soil & Crop Improvement Association

Funded by an Ontario Soil & Crop Improvement Association Partner Grant

Our Focus today

- Soil testing



The question

Why don't more farmers soil sample?

Is it because of:

- *Time*
- *Price*
- *Don't think it is necessary*
- *Do not know how to use information or...*

H-3 Project

- “H-3” = Healthy Farms, Healthy Soils, Healthy Environment project
- 2.5 year partnership project between East Central Soil & Crop Improvement Association and OMAFRA
- Project launched in Aug 2012

Samples sent to A & L Canada Laboratories for analysis.

Soil testing package

- Phosphorous (bicarbonate)
- Potassium
- Magnesium
- Calcium
- Sodium
- pH
- Manganese
- Aluminum
- Organic matter
- Zinc
- Sulfur



Farm paid for most of the cost of analysis (\$13.56/sample)

H-3 program covered cost for the sulfur analysis and a bit more.

- At least **20 cores/field**; mixed for composite sample
- Up to **25 acres in one sample**
- Walk the entire field to ensure random sample
- Consistent and reproducible method

Sampling Methods



Sampling realities....the farmer perspective

- Timing...when is the field going to be planted or harvested
- Manure or fertilizer applications
- Time to show us the fields, etc
- Availability of rented fields
- When does freeze-up happen?
 - 2012...last sampling date Dec 19
 - 2013...last sampling date Nov 22

Sampling realities...the project perspective

- Timing...availability of students
- Assessing demand...originally thought that there might only be 40 farms interested in sampling the last year
- Time for mapping
- Weather...see previous slide

Original H-3 projections

2012 – 10 participating
farmers

2013- 20 participating
farmers

2014 – 40 participating
farmers

Actual H-3 participants

9 participating farms

56 participating farms

79 participating farms

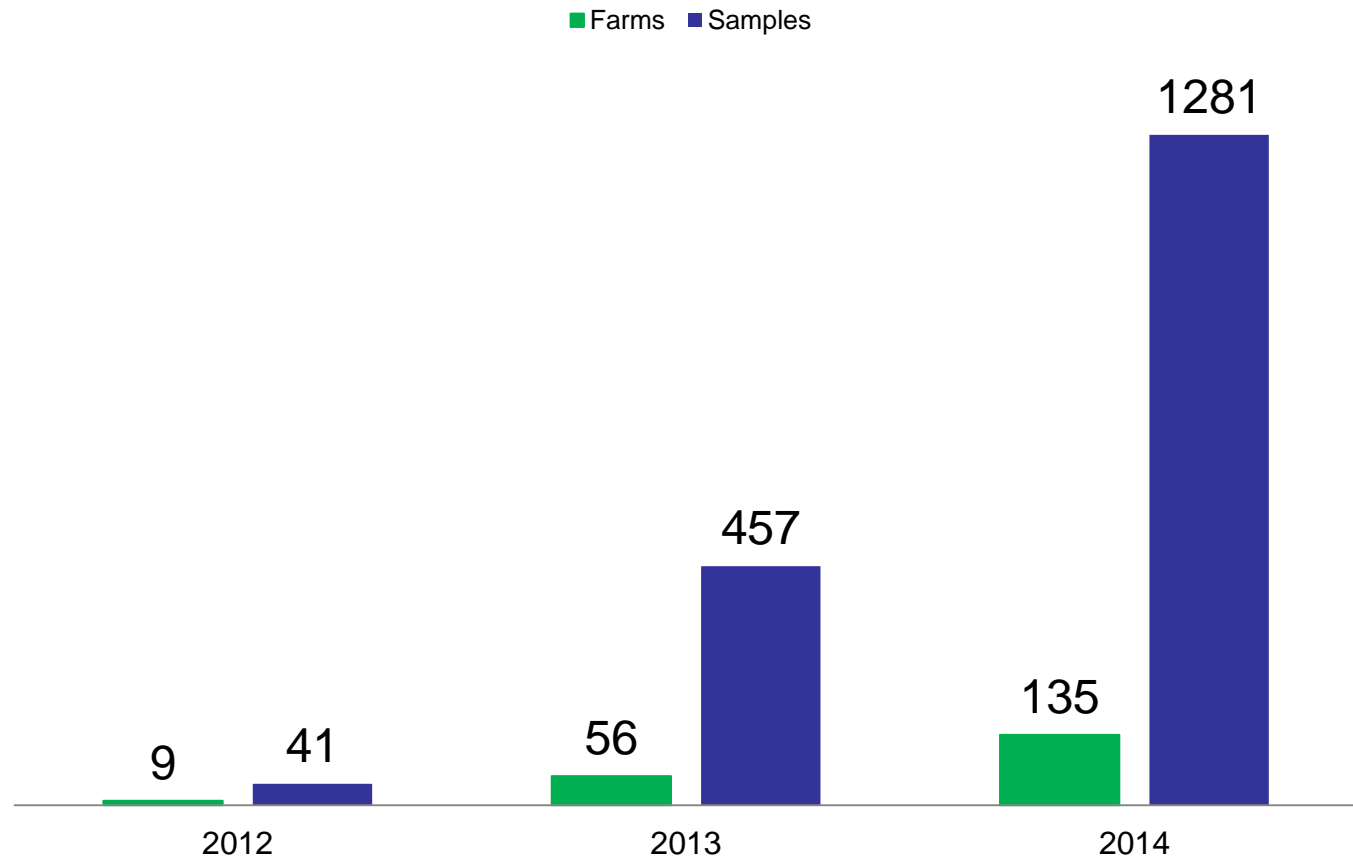
*\$5000/year from OSCIA
Partner Grant*

Project completed in
fall 2014

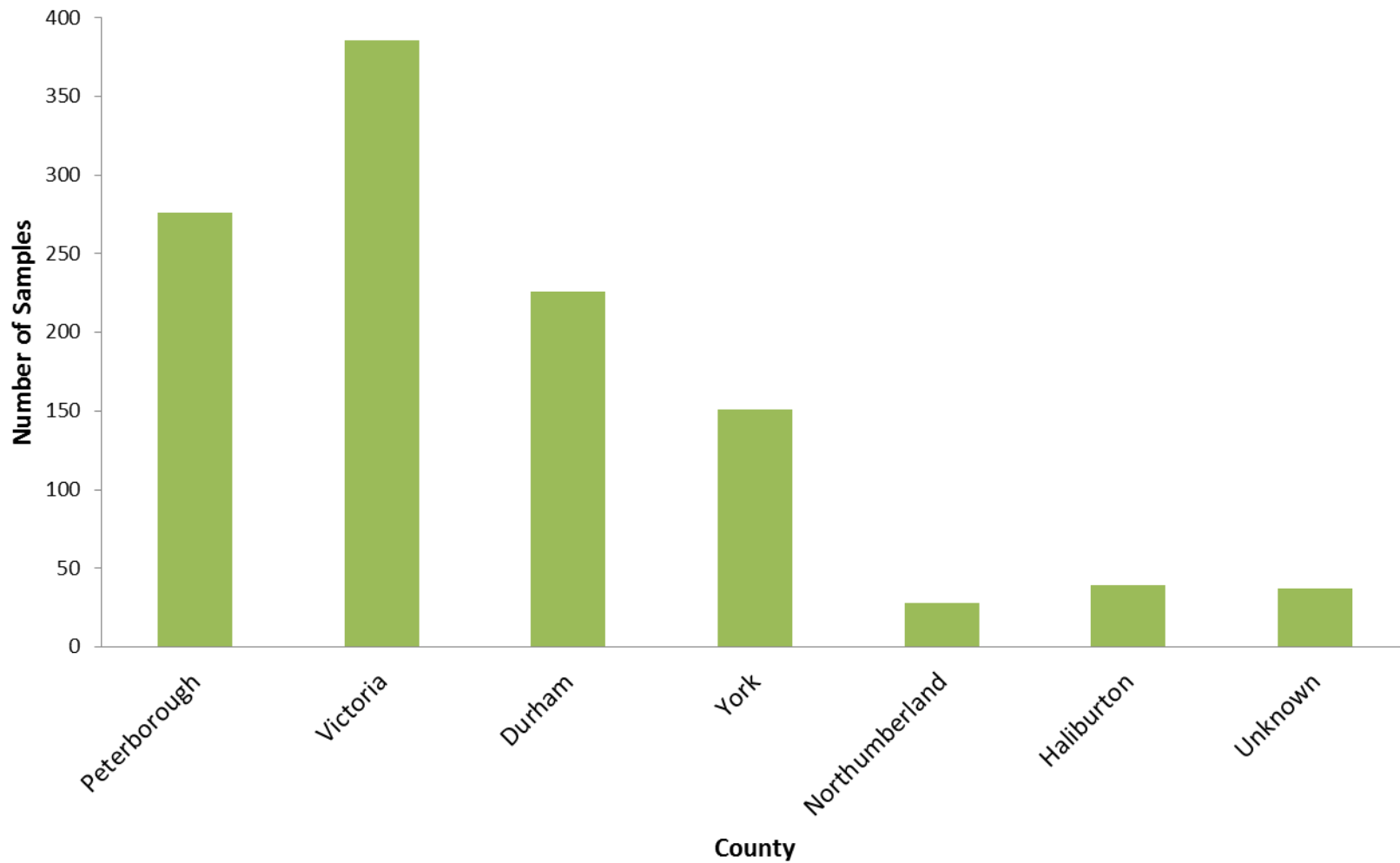
Soil sampling considerations...

- Prefer not to sample fields with recent manure/fertilizer applications (*but we sampled a few of these fields*)
- Fields should be re-sampled every 3-5 years for P, K, pH, etc
 - observe nutrient trends for fields over time
- Be careful with “oddspots” such as previous cattle wintering areas, dead furrows (subsoil), etc
- May be beneficial to sample these “oddspots” separately
- Soil test results...gives snapshot of nutrient “additions and subtractions” from last 10-20 years

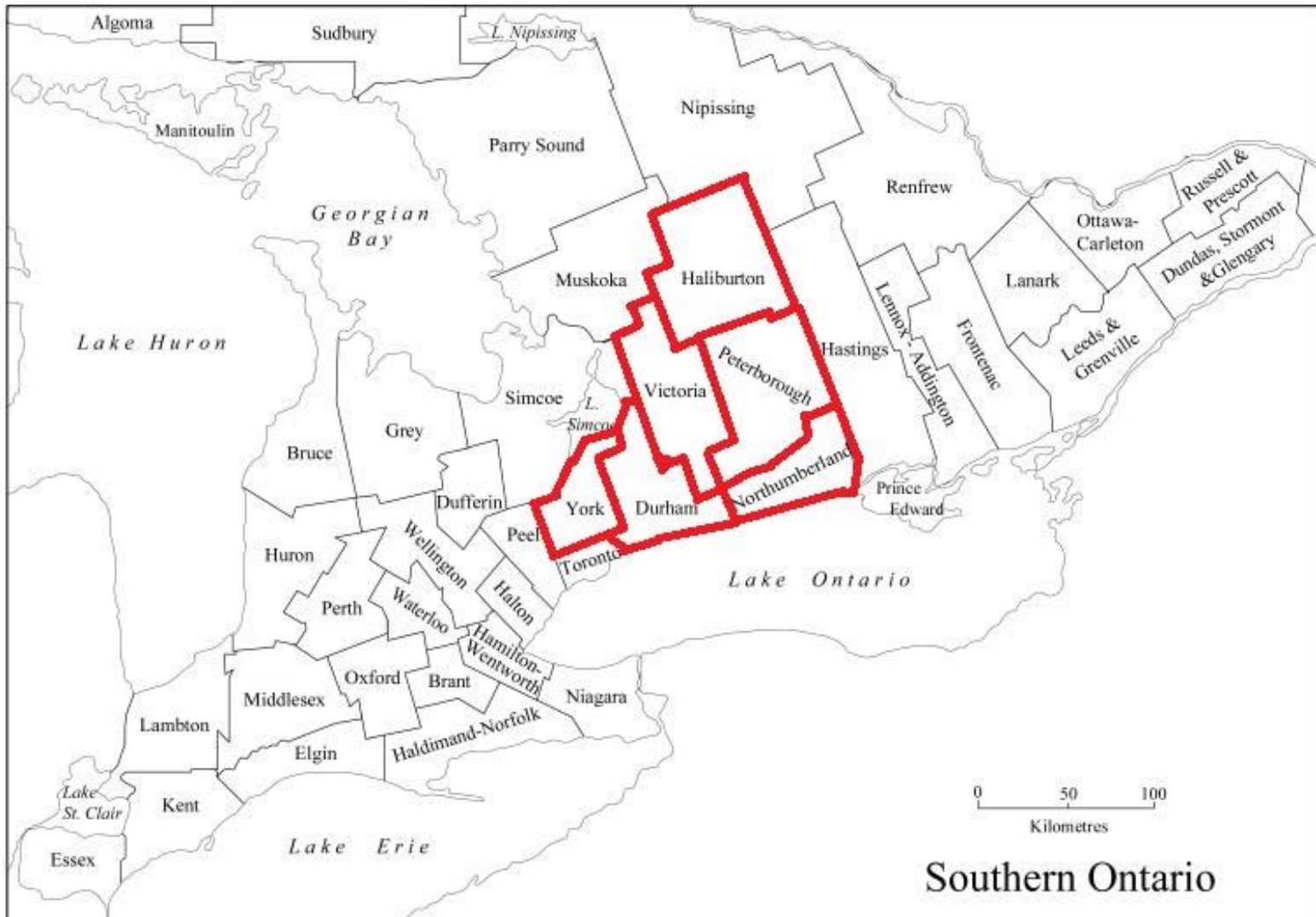
H3 Participating Farms and lab samples submitted by year (cumulative values)



Total Number of Samples by County

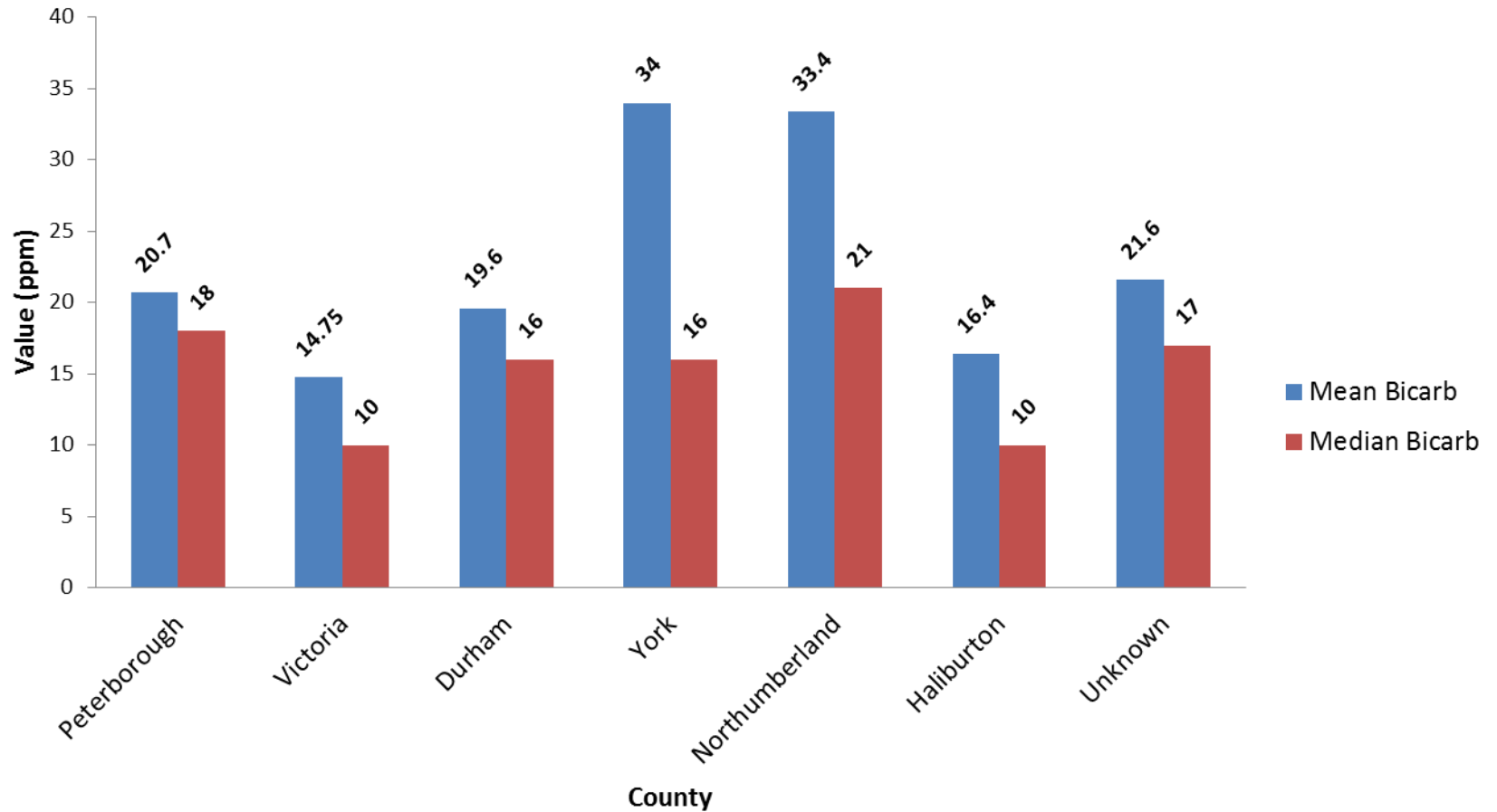


Counties Involved

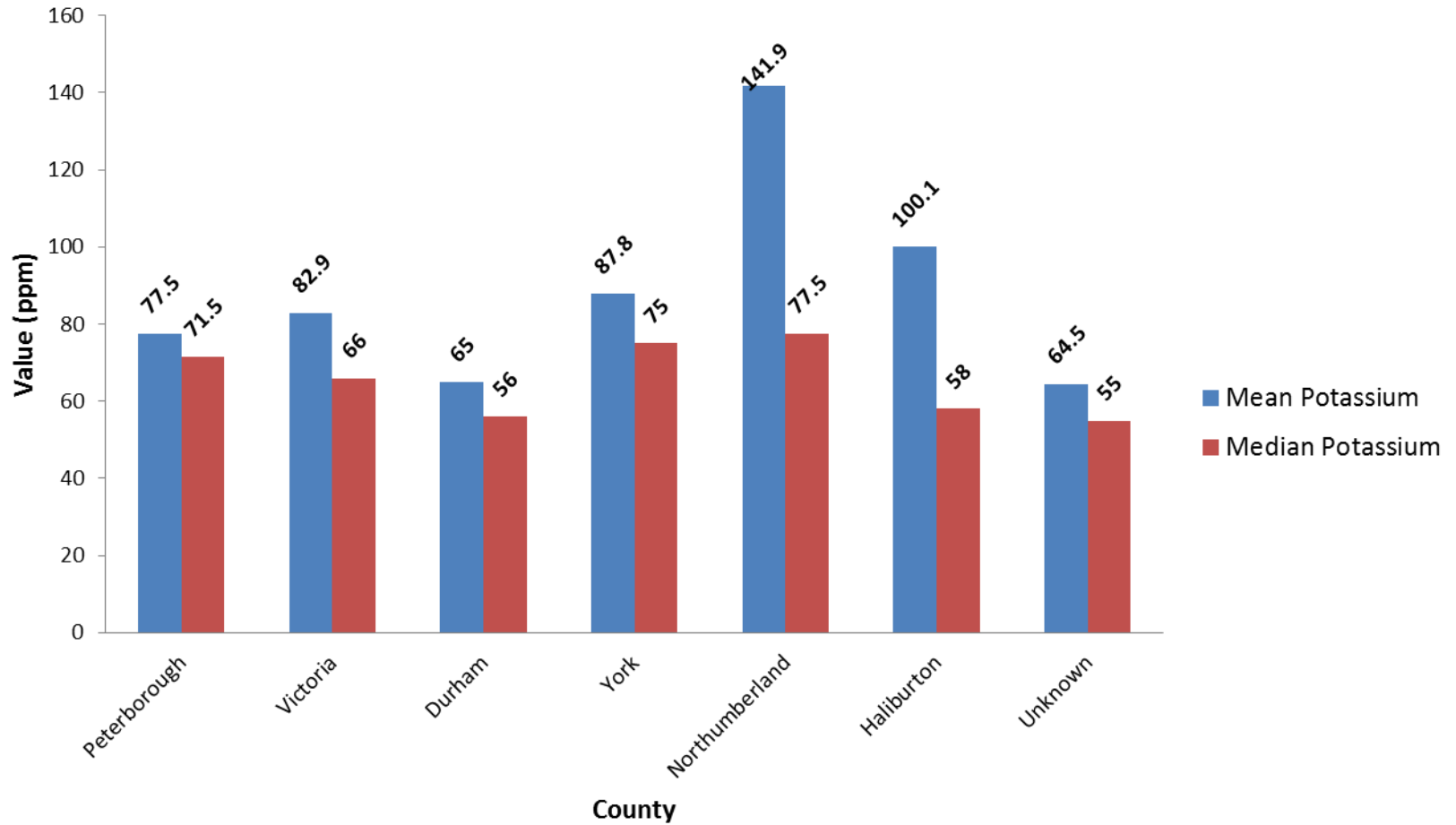


Map modified from the original by Cartographic Office, Department of Geography.

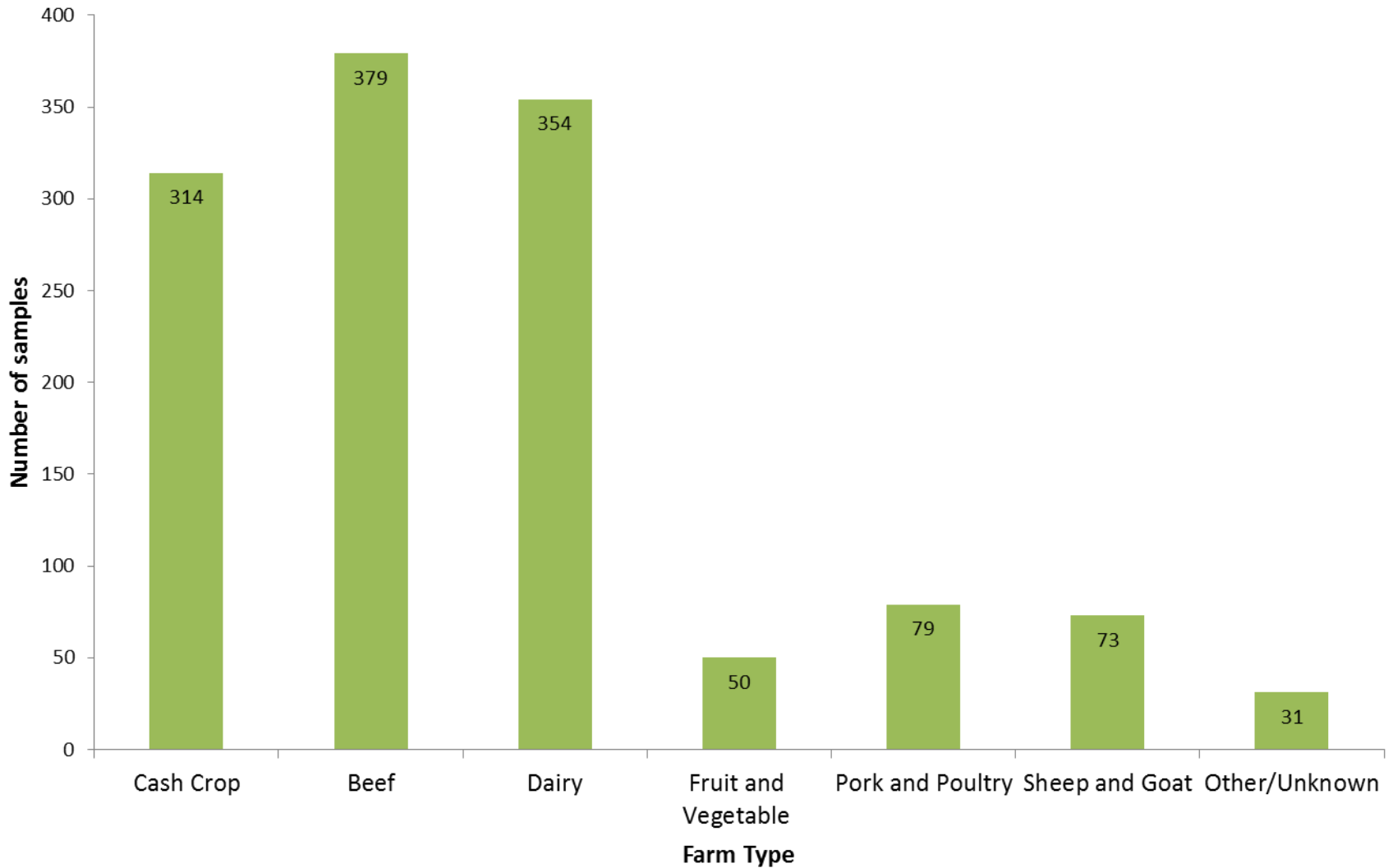
Mean and Median Soil P Values (bicarb extractant) by County



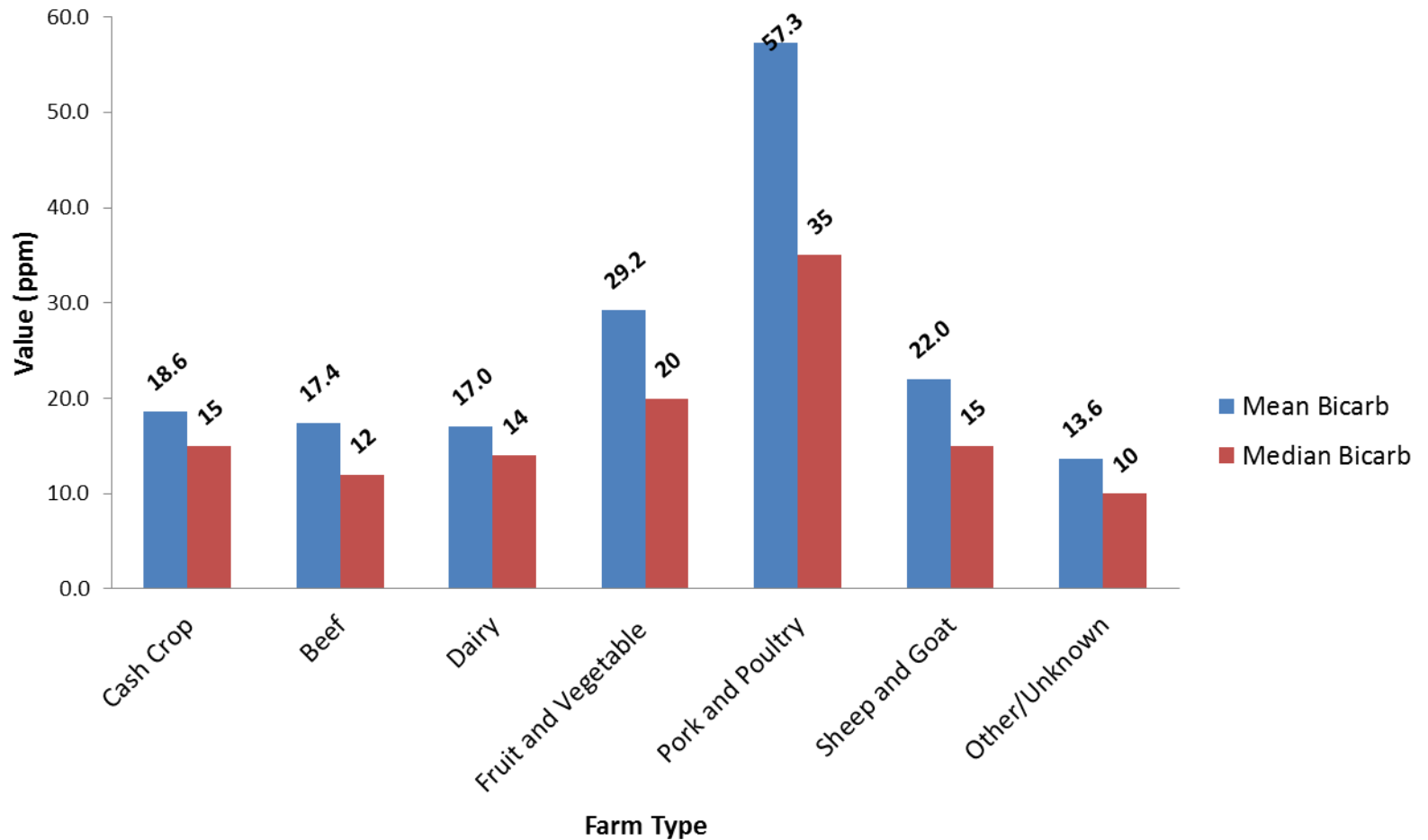
Mean and Median Soil K Values by County



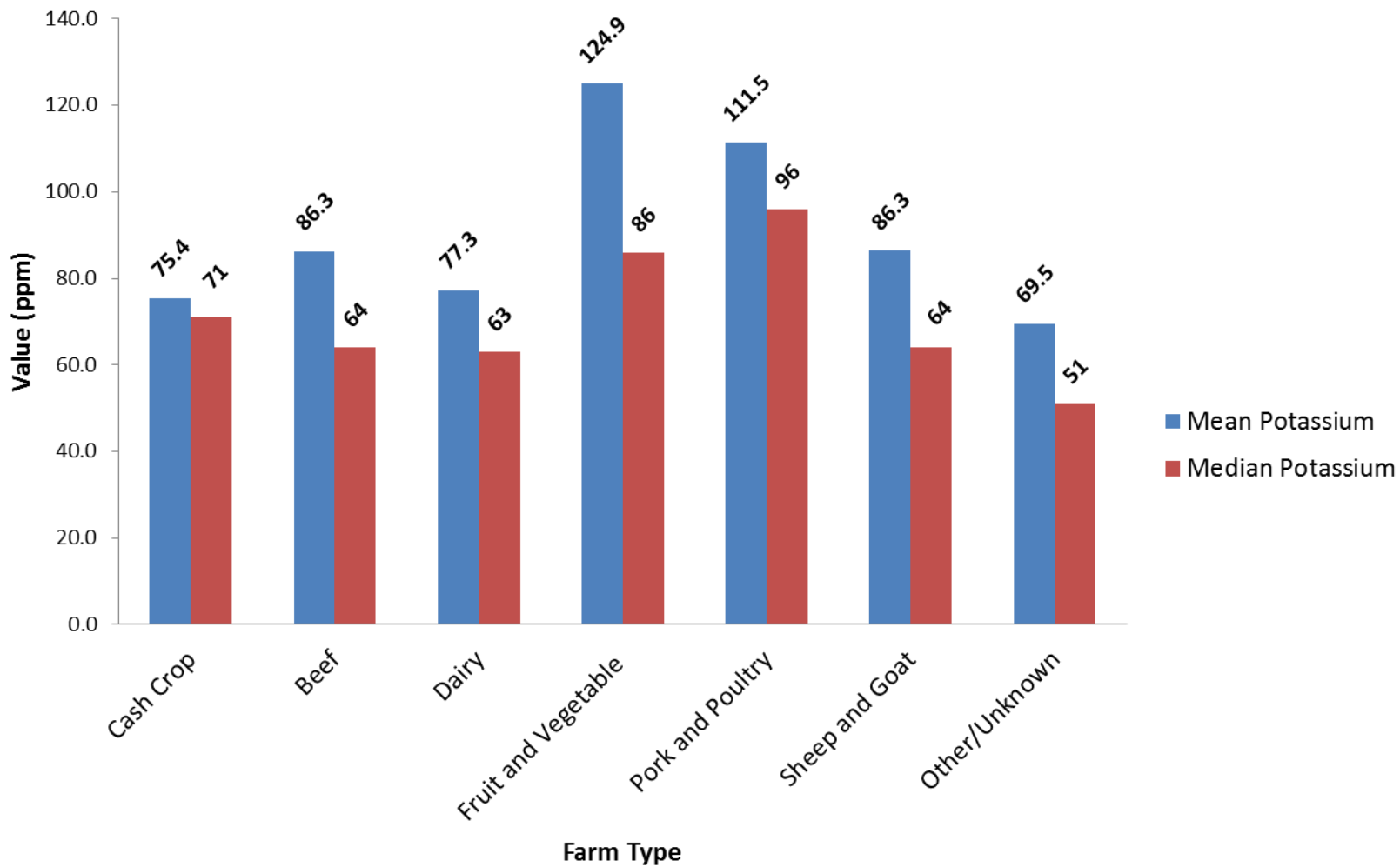
Total Number of Samples Taken by Farm Type



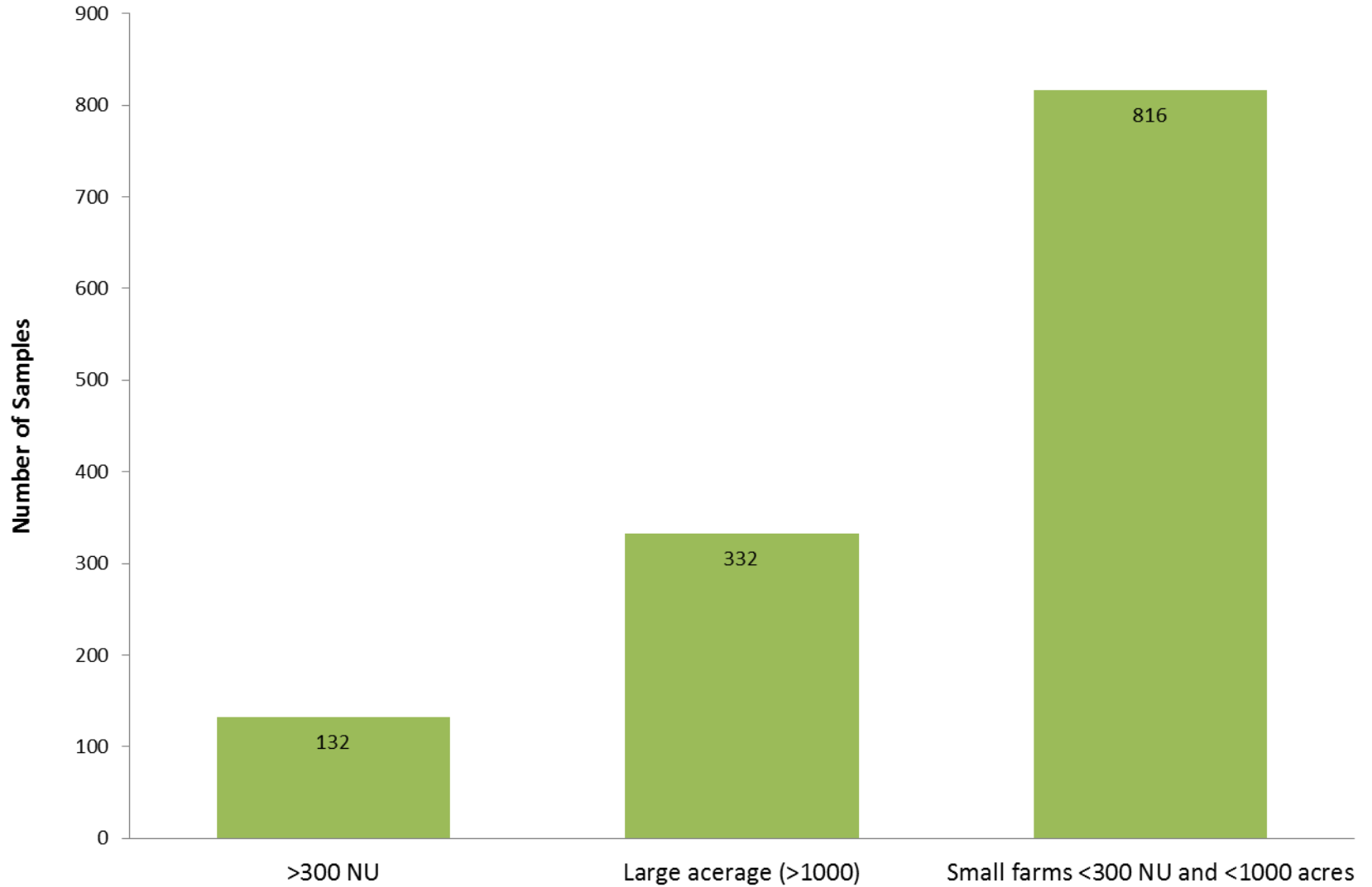
Mean and Median Soil P Values (bicarb extractant) by Farm Type



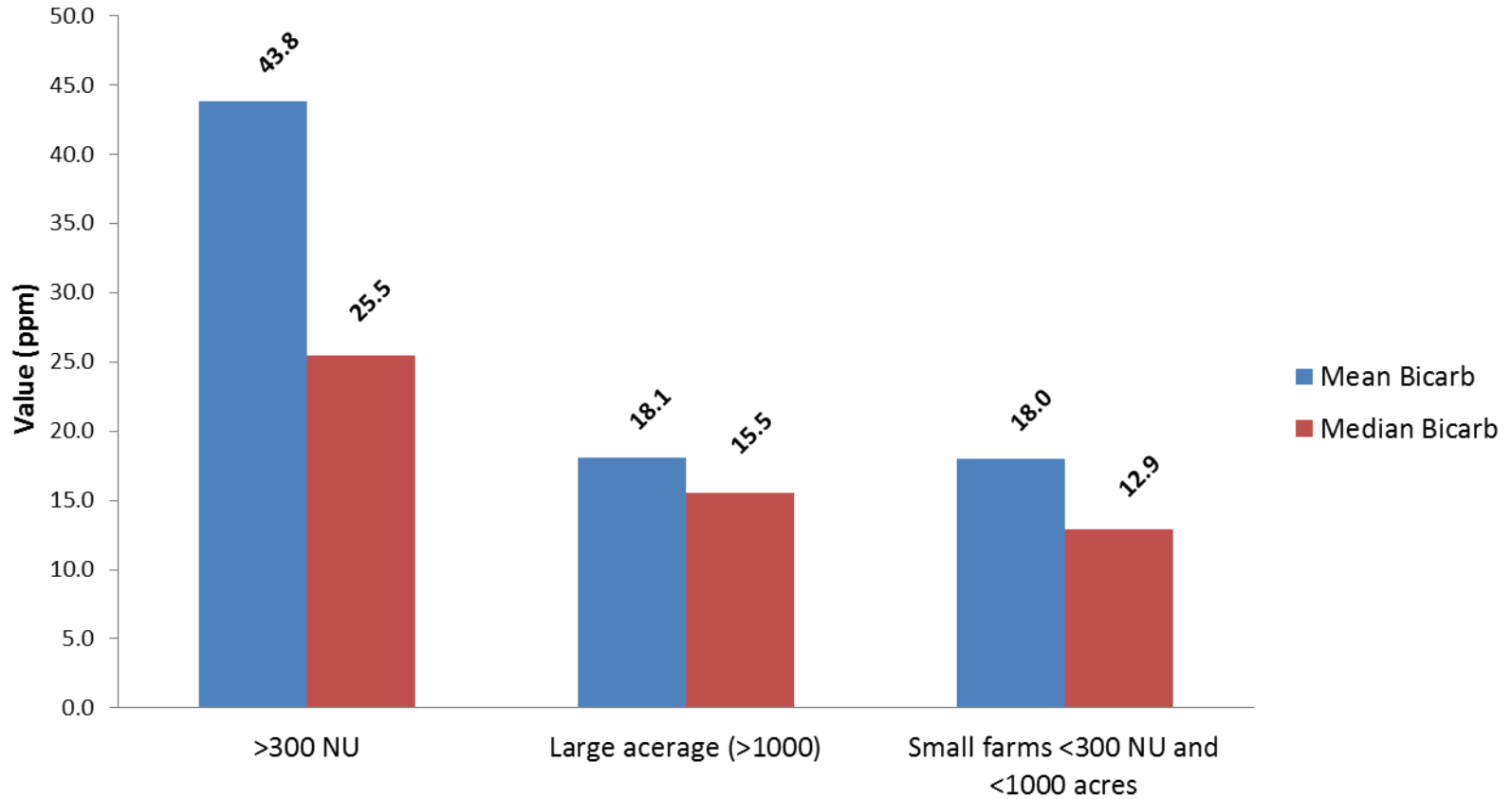
Mean and Median Soil K Values by Farm Type



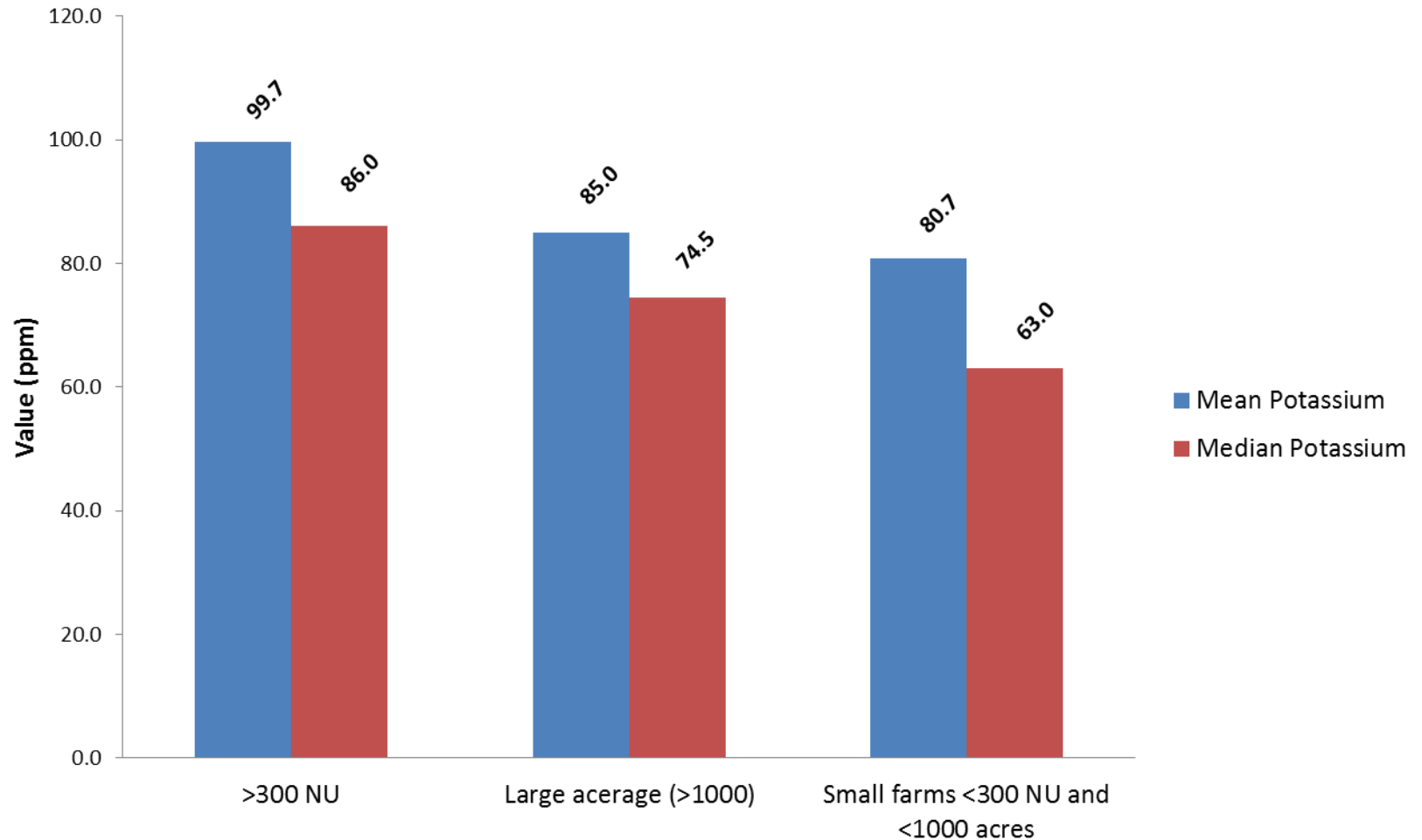
Total number of Samples Taken by Farm Size



Mean and Median Soil P Values (bicarb extractant) by Farm Size



Mean and Median Soil K Values by Farm Size



A few stats

- Average P value (Bicarb method) = 21 ppm
- Median (1/2 values above, 1/2 values below) for P = 14 ppm
- Average K value = 84 ppm
- Median K value = 68 ppm

18% of fields sampled were greater than 30 ppm P
(i.e. low probability of a response to additional P applications)

24% of fields sampled were greater than 100 ppm K
(i.e. only minimal K required...K application still recommended on hay fields)

Project level conclusions

- I. **Farmers were very positive about soil sampling**
 - a) **Especially if someone else does the sampling!**
 - b) **Price may be a factor for some**
- II. **Peer-to-peer communication works (*“hey, I saw you sampling at the neighbours; come over here!”*)**
- III. **Workshops were well received**
- IV. **Vast majority of fields sampled indicate that the “over application of nutrients has not been a problem”**

So why don't more farmers collect soil samples?

Some of the “barriers” to soil testing:

1. Time to collect samples
2. Lack of a soil probe
3. Other priorities would arise on the farm
4. Questions about how to collect a composite sample for field
5. Availability of the field (i.e. after harvest or before planting)

4Rs of Crop Nutrient Stewardship

In terms of keeping nutrients in the field (where we want) and minimizing losses to the environment, the latest focus is on the 4Rs of nutrient stewardship

- Right Rate
- Right Source (product)
- Right Place (example, nutrients placed 2” beside seed and 2” below)
- Right Time

Reference: Canadian Fertilizer Institute

Right rate seems to be OK (albeit low)

Is there room for improvement with the other “Rs”??

- Right Time
- Right Source
- Right Place

Consider 3 fields planted by the same farmer for 150 bushel corn crop

Fields	Soil P & K	To meet agronomic recommendations	\$\$- from RCAT Input survey
1 Low field	7 ppm P	150 lbs MAP (11-52-0)	\$54.14/ac MAP = \$796/t
	43 ppm K	210 lbs of 0-0-60	\$67.11/ac (0-0-60= \$704)
2 OK field	22 ppm P	30 lbs of MAP	\$10.82/ac
	110 ppm K	40 lbs of 0-0-60	\$12.78/ac
3 Field beside the Barn	35 ppm P	0 lbs of MAP	0
	220 ppm K	0 lbs of 0-0-62	0

Concluding thoughts

- 1. Farmers are keen on soil testing but barriers need to be addressed**
- 2. In terms of 4Rs of nutrient stewardship, “rate” is OK on most farms (perhaps a little low actually)...what about the other 3 Rs?**
- 3. View soil test reports as “medium term calibration tool” for your fields every 3-5 years**
 - a) Consider all sources of nutrients (fertilizers, compost, manure)**
 - b) Use soil test results to look for opportunities to “fine tune” (example, a bit more K and bit less P in the fertilizer blend)**



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Thanks to:
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