Manure Trends Across Animal Species

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MVTL Agronomy Update
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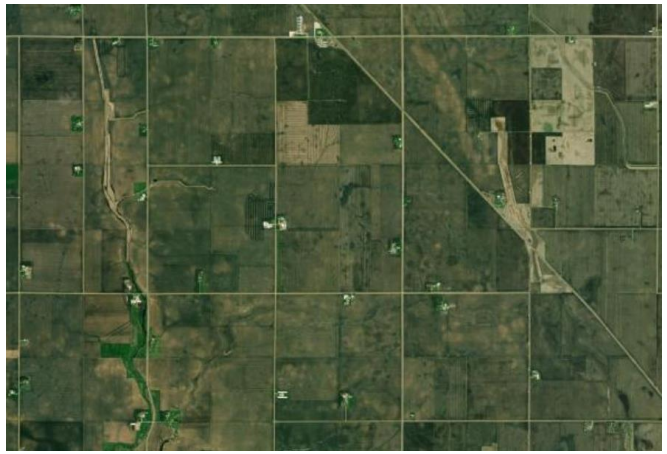
Overview

- Manure provides nutrients for cropping systems.
- Current published livestock manure “book values” (the approximate manure nutrient concentrations) used in the United States (U.S.) are several decades old.
- Recent data from several Midwest U.S. labs indicated manure nutrient data has changed compared to published Midwest Plan Service (MWPS) manure book values (2004).
- The University of Minnesota has grant funding to create a manure nutrient database called ManureDB to update these values.
- We are partnering with laboratories that analyze manure.

What are manure book values used for?

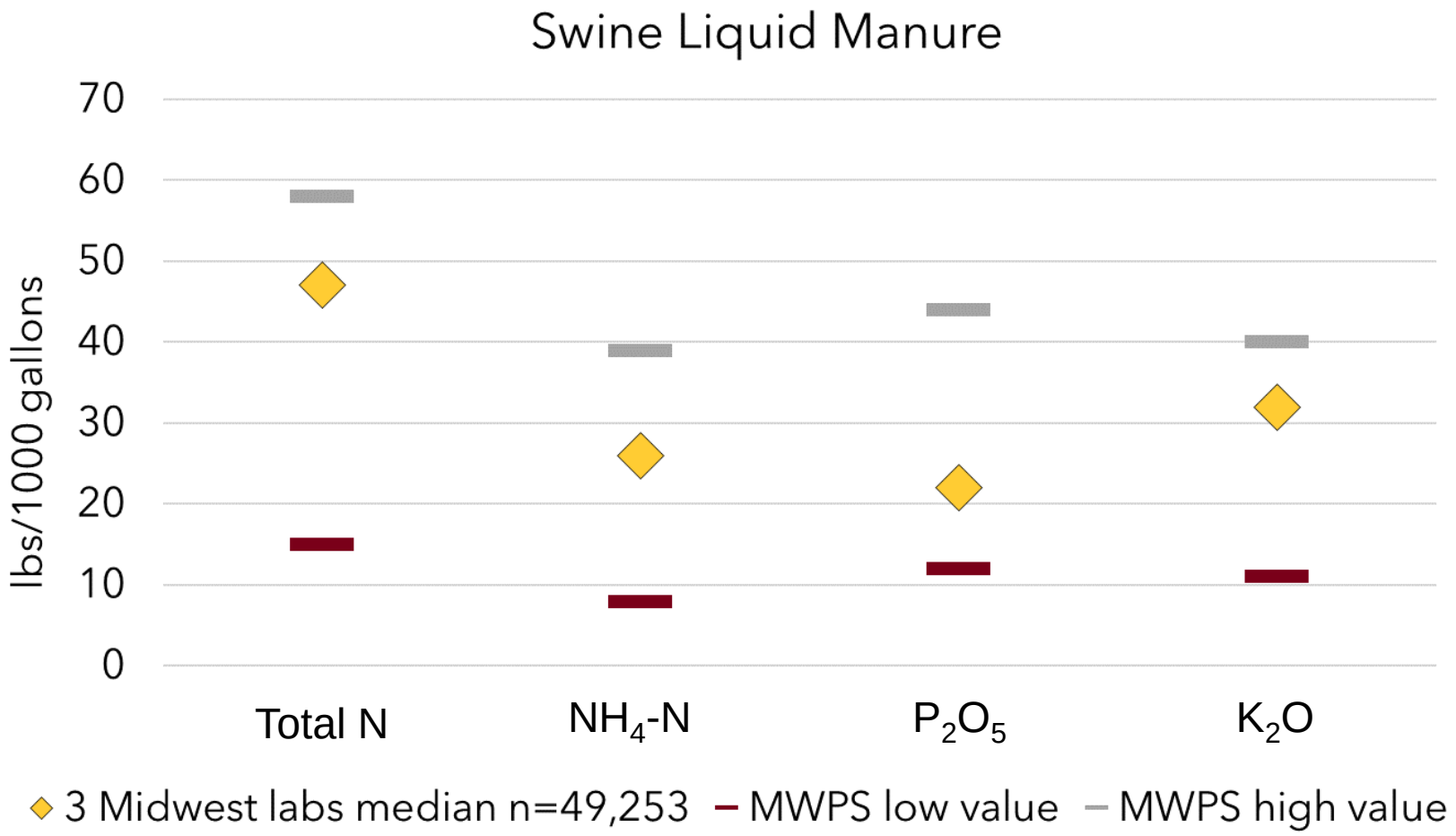


- Developing manure management plans
- Designing manure storages
- Establishing best management practices for manure land application
- Modeling nutrient cycling and gas emissions

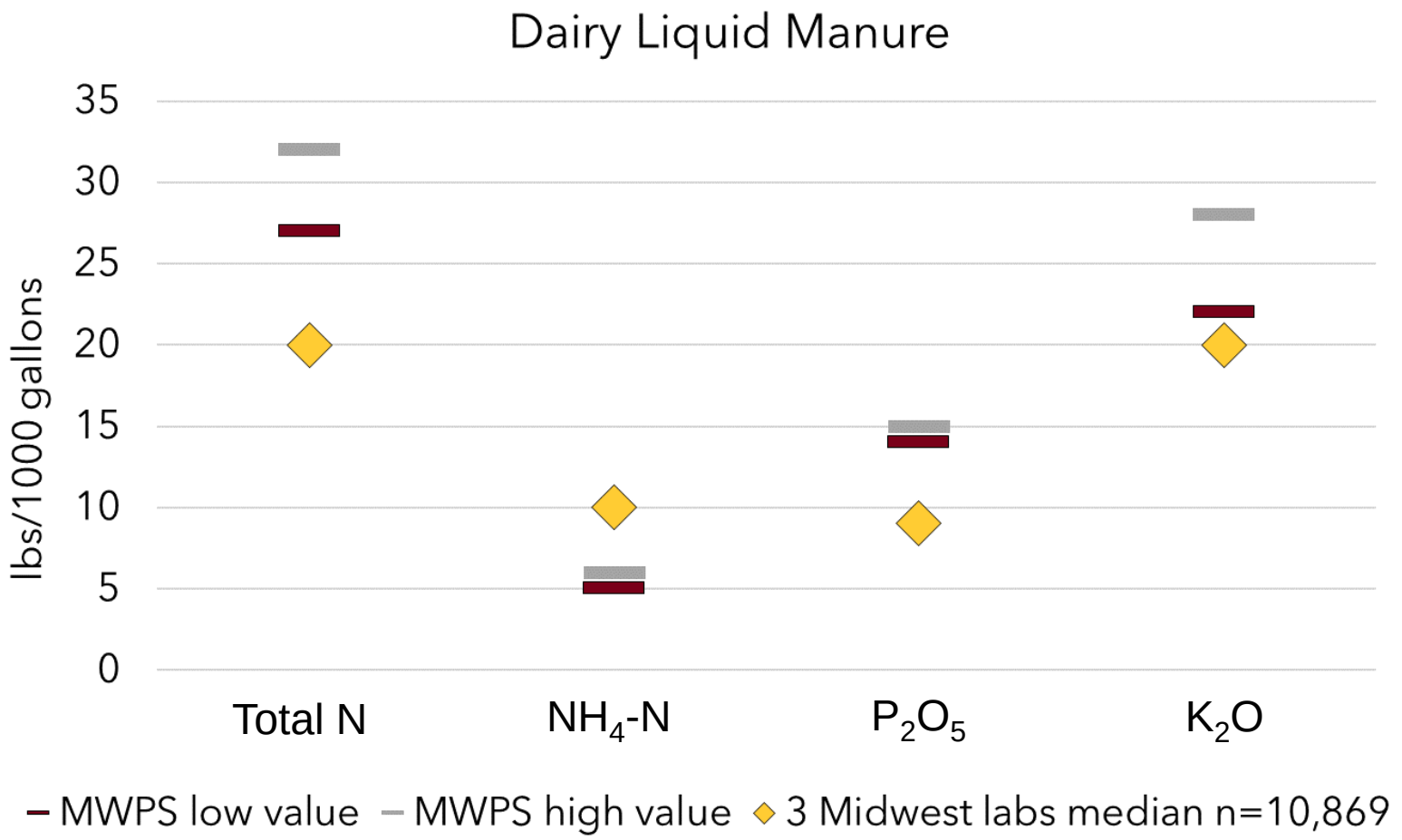
Preliminary Lab Data

- Three Midwestern laboratories
  - Over 80,000 samples!
- Samples from 2012-2021
- Sorted between liquid and solid
- Divided into four main livestock groups
  - Beef
  - Dairy
  - Poultry
  - Swine

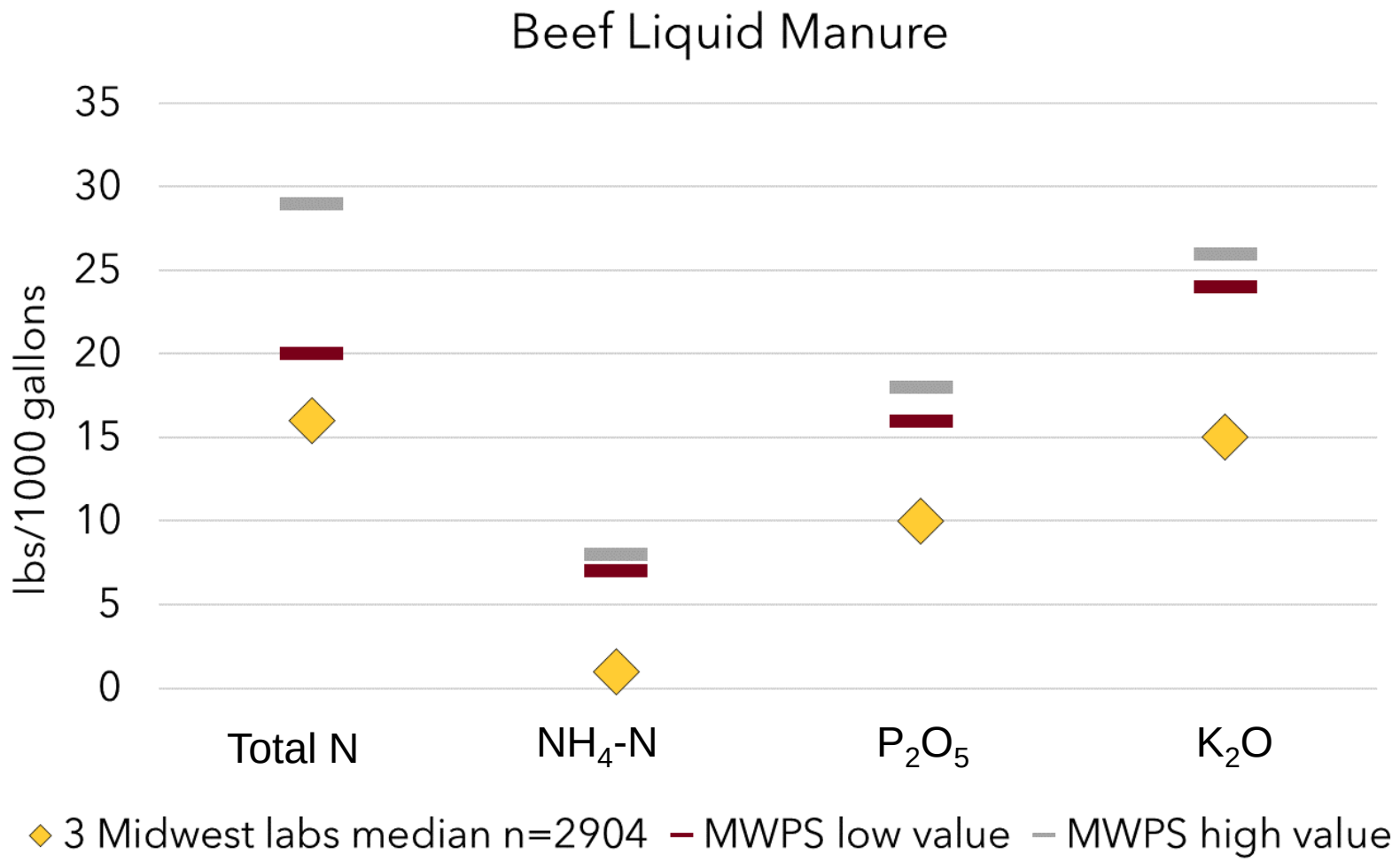
Comparing MWPS to 3 Labs - Swine Liquid Manure



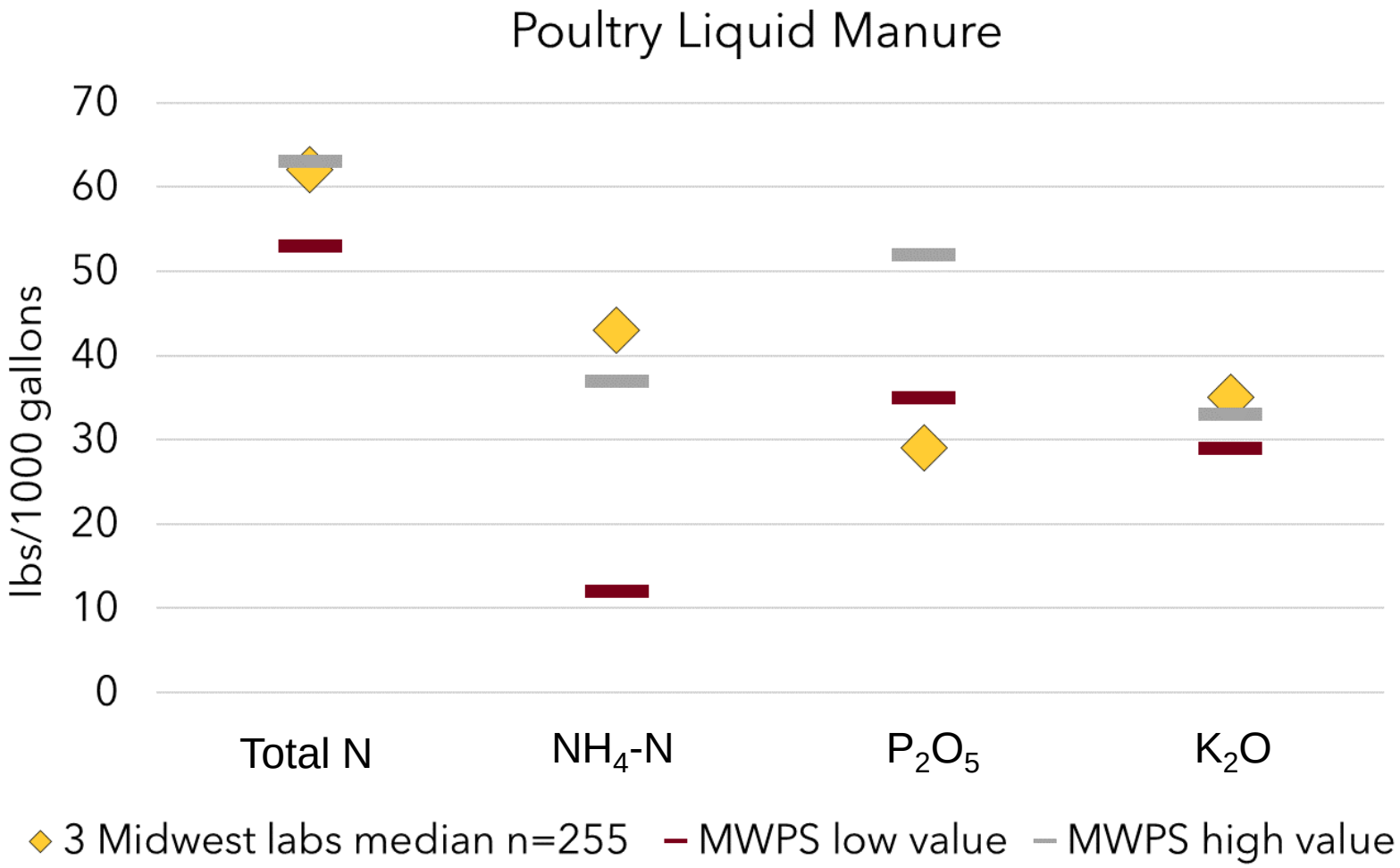
Comparing MWPS to 3 Labs - Dairy Liquid Manure



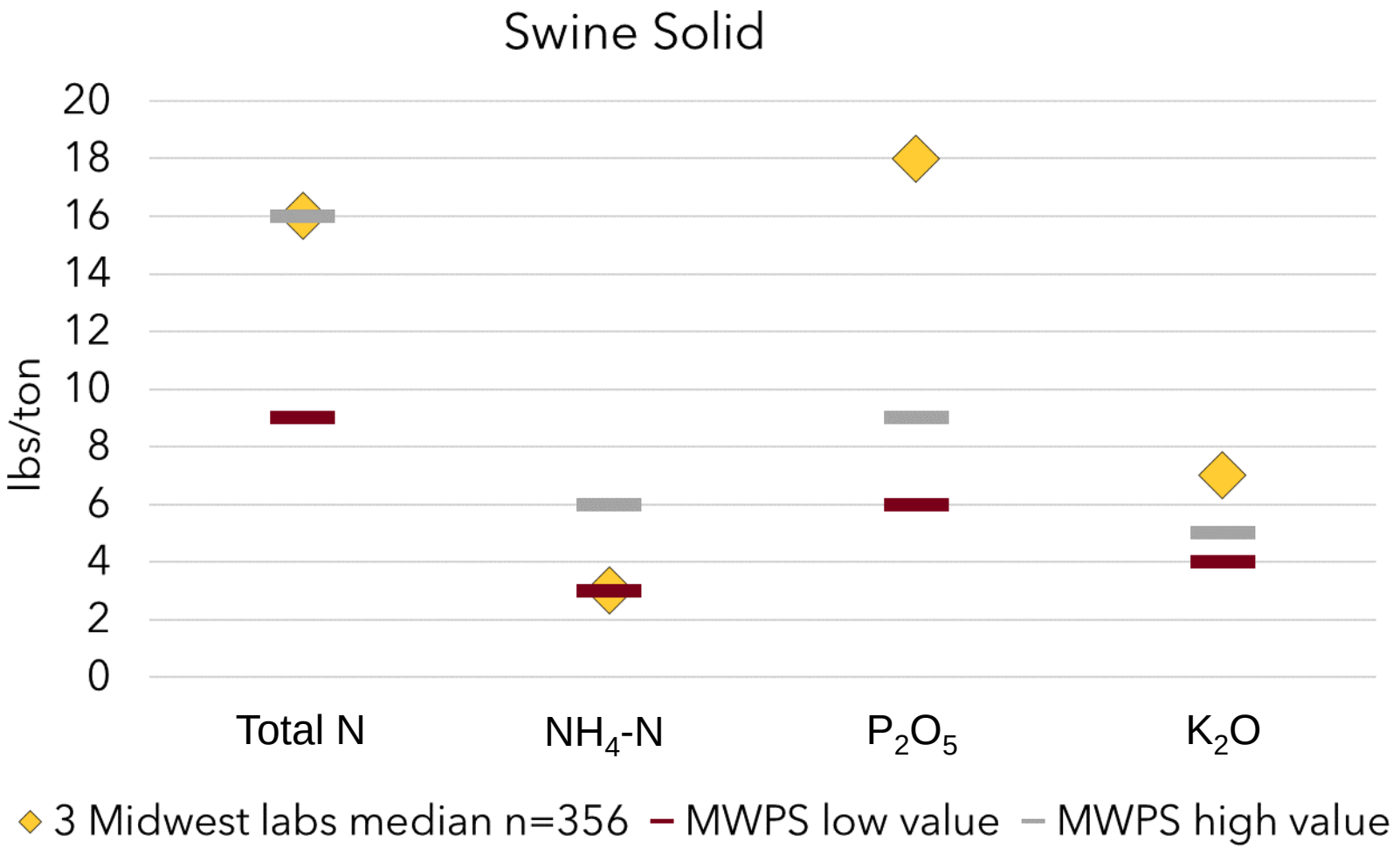
Comparing MWPS to 3 Labs - Beef Liquid Manure



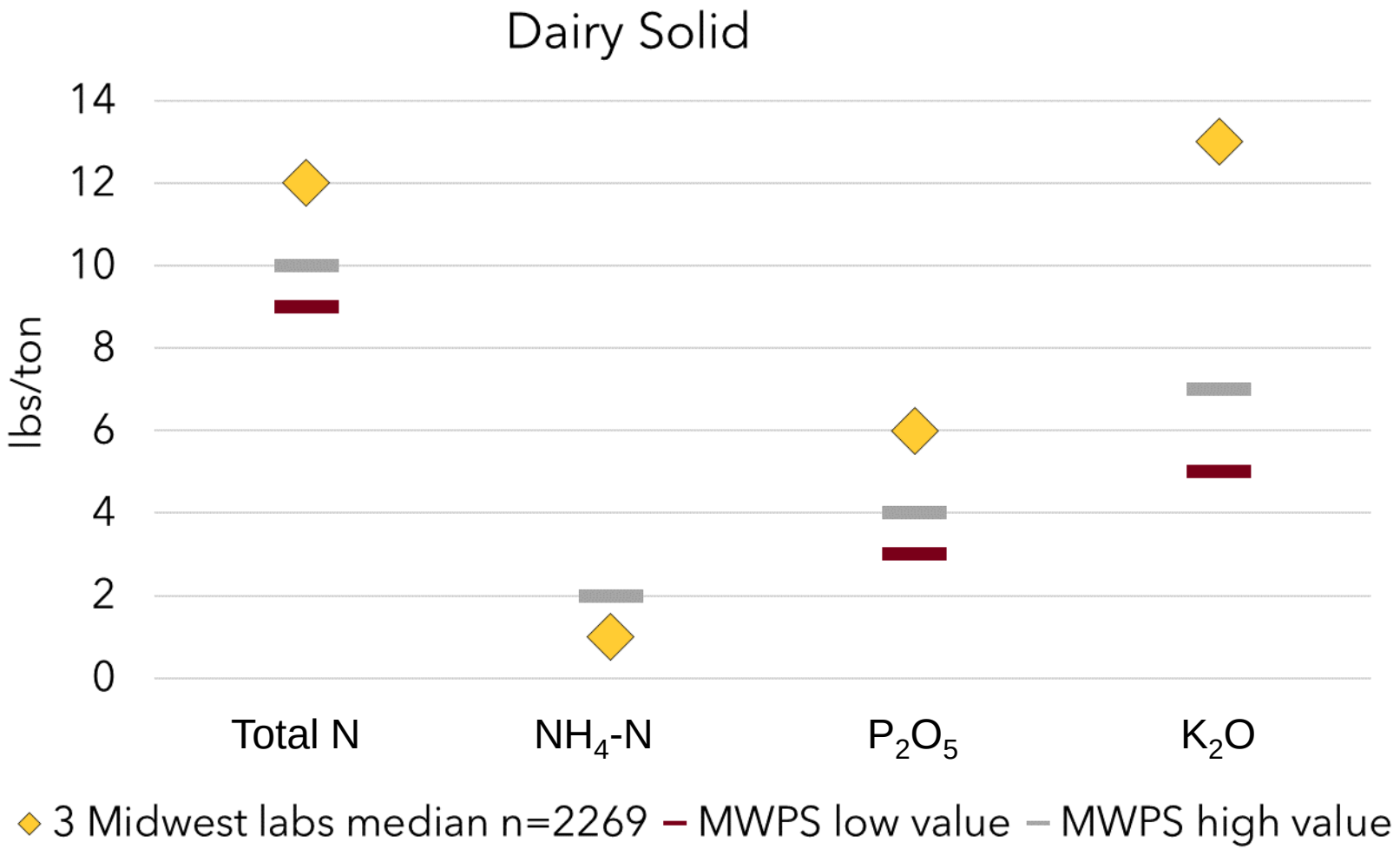
Comparing MWPS to 3 Labs - Poultry Liquid Manure



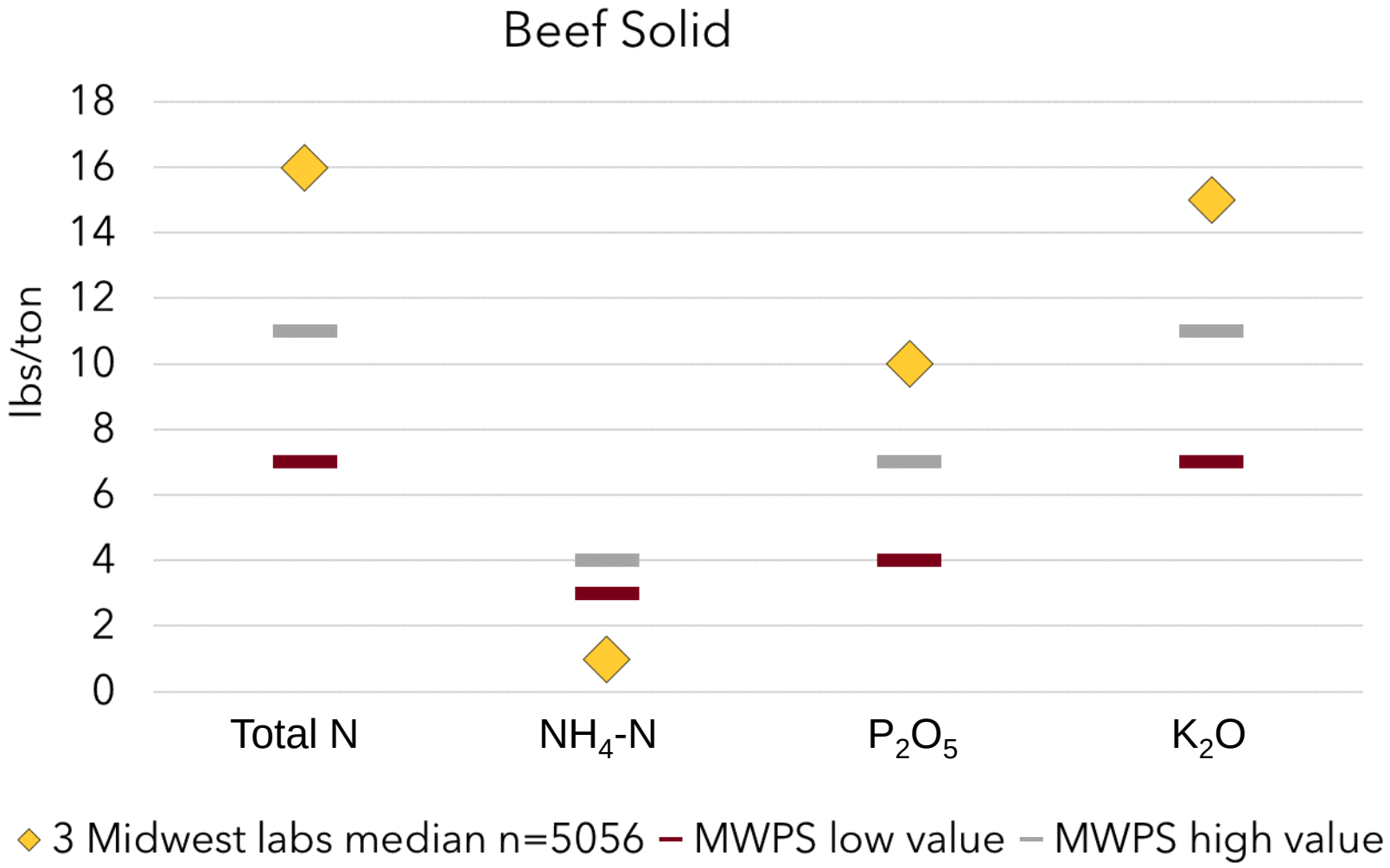
Comparing MWPS to 3 Labs - Swine Solid Manure



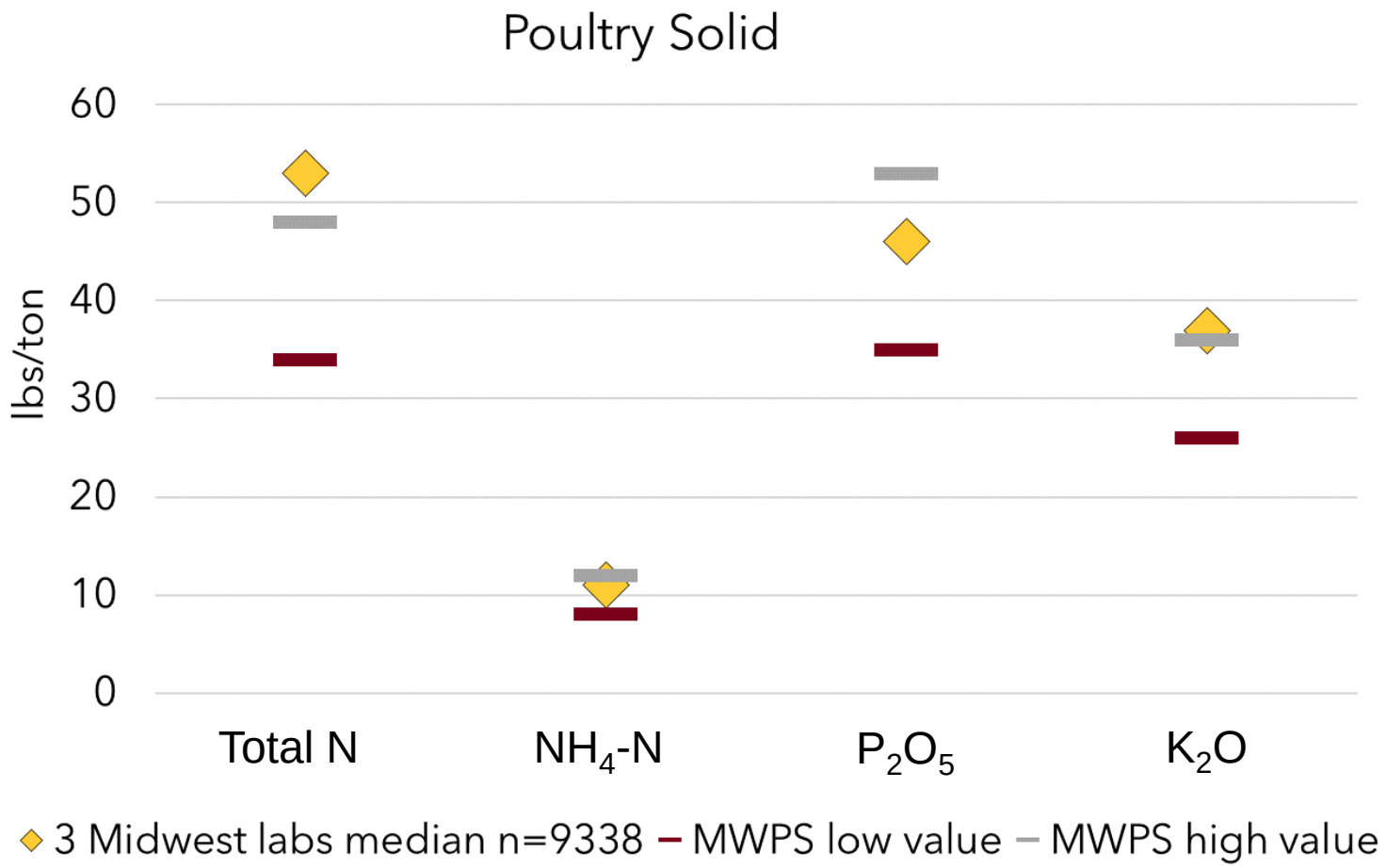
Comparing MWPS to 3 Labs - Dairy Solid Manure



Comparing MWPS to 3 Labs - Beef Solid Manure



Comparing MWPS to 3 Labs - Poultry Solid Manure



Summary

- Preliminary data from 3 labs showed changes in manure trends from published manure book values

- Detailed metadata will be key for future robust comparisons

ManureDB: Nationwide Manure Test Database

-Minnesota Supercomputing Institute

-Stakeholder group

-Schema

-Database

-Website

-Laboratory cooperation

-Currently cleaning and uploading data

-Over 58,000 samples in the database with more getting processed for entry

ManureDB Home About Data Resources Project Team & Collaborators Contact Us

ManureDB is an aggregating tool of manure laboratory analyses where data can be utilized in a standardized way.

Choose a Manure Type

Beef | Dairy | Swine | Poultry | Horse

Beef	Beef	5987
Biosolids	Biosolids	0
Bison	Bison	7
Cattle	Cattle	749
Dairy	Dairy - Calf	0
Dairy	Dairy - Calf and Heifer	0
Dairy	Dairy - Heifers	20
Dairy	Dairy - Lactating Cow	4
Dairy	Dairy - Dry Cow	4
Dairy	Dairy	9330
Deer	Deer	6
Fish	Fish	0
Horse	Horse	52
Llama	Llama	0

Customize Your Search

Year Analyzed

- [x] 2022
- [x] 2021
- [x] 2020
- [x] 2019
- [ ] 2018
- [ ] 2017
- [ ] 2016

State

- [ ] AL
- [ ] AR
- [ ] AZ
- [ ] CA
- [ ] CO
- [ ] FL

Manure Type

- [ ] As-excreted (urine)
- [ ] As-excreted (feces)
- [ ] Litter
- [ ] Compost
- [ ] Truck Wash
- [ ] Paunch
- [ ] Unknown

If no Manure Type is selected, all will be searched, including those samples that do not have an assigned Manure Type.

Storage Type

- [ ] Lagoon
- [ ] Uncovered Pit or Tank
- [ ] Covered Pit or Tank
- [ ] Earthen Basin
- [ ] Runoff Holding Pond
- [ ] Solid
- [ ] Underfloor Solid

Explore Data

Select Analyte of interest: Total Nitrogen

Select Animal Type of interest: Dairy

Select Year: 2019 (Optional)

Search

What we have learned with incoming data

- Most samples have minimal descriptions beyond animal species and little is known about storage types
  - Age, nutrition, housing, manure handling and storage all can affect these nutrient levels

Future Plans

- Finish construction and user-testing of ManureDB beta site in collaboration with participating laboratories
- Publish ManureDB as a publicly available website
- Recruit more laboratories to participate in the database

Stay in the loop!

If you are interested in learning more about this project, please contact us!

- Email manure@umn.edu
- Sign up for ManureDB updates z.umn.edu/ManureDB-signup

Acknowledgements

Additional Authors:

- **Melissa L. Wilson**, Associate Professor, University of Minnesota
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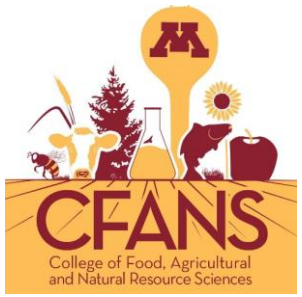

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