From: Soil & Water Conservation Program
To: DNR.Soil and Water Conservation Districts staff
Cc: DNR.MGS SWC Staff
Subject: FW: MU Online Manual Entry requiring buffer pH or neutralizable acidity
Date: Thursday, August 13, 2026 7:40:56 AM
Attachments: image001.png
image002.png

Good morning,

Please see the email below from Pat Turman on guidance addressing pH soil test values.

Thanks.

MoDNR Soil and Water Conservation Program
573-751-4932 | dnr.mo.gov

Please take a few minutes to complete our Customer Satisfaction Survey. Thank you.

From: Turman, Patricia - FPAC-NRCS, MO <pat.turman@usda.gov>
Sent: Wednesday, August 12, 2026 12:57 PM
To: ug-MO-nrcs <mo-nrcs@usda.gov>
Cc: Plassmeyer, Jim <jim.plassmeyer@dnr.mo.gov>
Subject: MU Online Manual Entry requiring buffer pH or neutralizable acidity

Good afternoon,

Please read this email thoroughly for what to do when dealing pH soil test values from approved labs that do not provide the buffer pH or neutralizable acidity (N.A.) needed for the MU online manual entry.

High pH situations:

There have been several questions coming in regarding certain approved laboratories not providing a buffer pH or N.A. when the water pH (pHw) level is already high. In this type of situation, first determine the estimated pH level by reducing the pH value by **EITHER** using the actual conversion from pHw equation of salt pH (pHs) = (pHw – 0.68365) / 0.95726 **OR** to get an approximation, you can subtract 0.5 from the water pH. These equations only provide an estimation and are not providing a Woodruff buffer pH value.

Examples:

- Soil test has a water pH of 6.8: (6.8 – 0.68365)/0.95726 = 6.4
- **OR** using the simplified approximation: 6.8 – 0.5 = 6.3

Next item to consider is when would MU provides a limestone recommendation. Limestone is recommended only when the salt pH falls into the "Very Low" or "Low" categories. For most crops, this corresponds to a salt pH below 5.8. With the above example, MU would not provide a limestone recommendation.

When using the on-line MU manual entry, it requires either a buffer pH or N.A. to be enter. Using the example above and when an approved lab is not providing those numbers due to high pH, then a value of "0" can be entered for N.A. **DO NOT USE a value of "1".** In these situations, we are needing to simply allow the recommendation program to run. If we enter a "1" as the default, then this corresponds to a Woodruff buffer pH of 6.9 and adds 1 meq/100 g to the estimated CEC without an analytical basis.

Low pH situations:
When the soil test pH value is equates to 5.8 or lower, then the buffer pH or the N.A. is needed and should be present on the soil test results. If it is not, then the lab needs contacted to get the either the buffer pH or the N.A. value. **DO NOT USE a value of "0" or "1".**

Soil pH measures active acidity, whereas N.A. measures reserve acidity, and one cannot reliably be estimated from the other. In addition, the MU recommendation program uses N.A., together with calcium, magnesium, potassium, and sodium (when available), to estimate CEC. Therefore, entering an arbitrary N.A. value could influence CEC-related interpretations and recommendations (particularly potassium recommendations), not just the lime recommendation.

I have also been asked about using the Sikora equation. The MU recommendation program was calibrated using the Woodruff buffer (N.A. = (7.0 − Woodruff buffer pH) × 10). The Sikora equation (N.A. = (7.0 − Sikora buffer pH) × 12) is based on a different buffer system and should not be substituted directly into the MU recommendations.

Please let me know if you have any further questions or if additional clarification is needed.

Patricia Turman
Acting State Resource Conservationist

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