Weist Farm

Soil Health & Nutrient Analysis Report

Generated December 12, 2025

TOTAL ACRES	FIELDS	SAMPLE POINTS	AVG HEALTH SCORE
1,791	9	544,028	74/100

FIELD COMPARISON

Field Name	Acres	Score	Primary Limiting Factor
Weist Farms Muddy Creek W	205	68	LOW SULFUR: 97% of field is sulfur deficient ...
Weist Farms Truchot T05	228	71	LOW SULFUR: 88% of field is sulfur deficient ...
Weist Farms Zier Z02	377	71	LOW SULFUR: 100% of field is sulfur deficient...
Weist Farms Truchot T09	234	74	LOW PHOSPHORUS: 35% of field is below optimal...
Weist Farms Weist W02	242	74	HIGH SOIL pH: 46% of field has pH above 8.0, ...
Weist Farms Weist W03	54	74	LOW SULFUR: 44% of field is sulfur deficient ...
Weist Farms Weist W07	69	74	LOW SULFUR: 100% of field is sulfur deficient...
Weist Farms Truchot T07	80	81	LOW ZINC: 100% of field has Zn below 1.0 ppm ...
Weist Farms Zier Z09	303	82	None identified

PRIORITY ACTIONS

Ranked by return on investment. Start with #1 for maximum impact.

1. **Weist Farms Muddy Creek W: Apply 10-15 lbs S/ac (97% of field deficient)**
   Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.
2. **Weist Farms Truchot T05: Apply 10-15 lbs S/ac (88% of field deficient)**
   Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.
3. **Weist Farms Truchot T09: Apply 10-15 lbs S/ac (100% of field deficient)**
   Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.
4. **Weist Farms Weist W03: Apply 10-15 lbs S/ac (44% of field deficient)**
   Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.
5. **Weist Farms Weist W07: Apply 10-15 lbs S/ac (100% of field deficient)**
   Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.
6. **Weist Farms Zier Z02: Apply 10-15 lbs S/ac (100% of field deficient)**
   Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.

COMMON ISSUES

REGIONAL COMPARISON

How your farm compares to 41 fields (9,505 acres) in our regional database

Metric	Your Farm	Regional Avg	Range	Ranking
Health Score	74	70	51-89	Average
Soil pH	7.5	7.3	5.1-8.4	OK
Organic Matter (%)	2.1%	2.8%	1.5-7.3	Low
Phosphorus - Bray (ppm)	36	24	3-90	Below Avg
Phosphorus - Olsen (ppm)	33	12	3-38	Top 25%
Potassium (ppm)	483	285	56-634	Average
Sulfur (ppm)	17	28	5-258	Low
Zinc (ppm)	1	1	0-2	Low

pH ranking based on proximity to optimal 6.8. Other metrics ranked by percentile.

Weist Farms Muddy Creek W05

ACRES	SAMPLE POINTS	HEALTH SCORE
205	64,676	68/100 (Fair)

STRENGTHS

+ ADEQUATE ORGANIC MATTER: 100% of field has OM in normal range for Montana (1.5%+)
+ STRONG CEC: Average of 26.2 meq/100g provides good nutrient holding
+ ADEQUATE PHOSPHORUS: 85% of field has sufficient P

KEY CONCERNS

! **LOW SULFUR: 97% of field is sulfur deficient - common in Montana dryland**
! **LOW ZINC: 99% of field has Zn below 1.0 ppm - can limit yields in small grains**

PRIORITY ACTIONS

1. **Apply 10-15 lbs S/ac (97% of field deficient)**
   Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.
2. **Apply 3-5 lbs Zn/ac (99% deficient, avg 0.79 ppm)**
   Priority: 8/10 | Band with starter or incorporate. One application lasts 2-4 years.
3. **Use variable rate sulfentrazone for pulse crops - INJURY RISK in some zones**
   Priority: 8/10 | Pre-plant or pre-emergence
4. **Apply 2-5 lbs Mn/ac (100% deficient, avg 1.0 ppm)**
   Priority: 5/10 | Band with starter, or foliar at tillering. NOT broadcast.

VARIABLE RATE OPPORTUNITIES

Nutrient	Range	VRA Recommendation
Phosphorus (Olsen)	8.0-74.0	YES - P ranges 8-74 ppm - vary rate to build low areas faster
Potassium	228.6-769.9	K is adequate across field (min 229 ppm) - maintain
Sulfur	5.3-12.6	YES - S ranges 5-13 ppm - vary rate by zone
Zinc	0.5-1.1	YES - All deficient but ranges 0.5-1.1 ppm - vary rate by severity
Manganese	1.0-1.0	Mn is uniform (1-1 ppm) - flat rate if needed
Soil pH	7.5-8.1	YES - pH ranges 7.5 to 8.1 - vary lime rate

NUTRIENT SUMMARY

Nutrient	Avg	Range	% Deficient	% Optimal	Status
Soil pH	7.8	7.5-8.1	0%	0%	High
Organic Matter	2.4	1.9-2.8	0%	100%	Good
Phosphorus (Olsen)	38.0	8.0-74.0	1%	24%	High
Potassium	451.1	228.6-769.9	0%	14%	High
Sulfur	8.1	5.3-12.6	97%	3%	Low
Zinc	0.8	0.5-1.1	99%	1%	Low
Manganese	1.0	1.0-1.0	100%	0%	Low
Copper	1.2	0.8-1.9	0%	100%	Good
Iron	10.6	4.7-20.3	0%	100%	Good
Boron	1.1	0.8-1.5	0%	100%	Good
Cation Exchange Capacity	26.2	24.3-28.8	0%	3%	High

Deeper Insights: Weist Farms Muddy Creek W05

Advanced soil analysis and agronomic interpretation

SOIL TEXTURE

SOIL TEXTURE: LOAM (0% clay, 0% sand, 0% silt)
+ Ideal texture - balanced water/air/nutrient properties
+ Good workability across moisture conditions
+ Moderate water holding with good drainage
= Few texture-related management challenges

WATER HOLDING & DROUGHT RISK

WATER HOLDING & DROUGHT RISK:
WATER HOLDING CAPACITY: LOW
Estimated ~1.0 inches available water per foot of root depth
! HIGHER DROUGHT RISK - soil drains quickly
- Crops will stress sooner in dry spells

PH EFFECTS ON NUTRIENTS

pH EFFECTS ON MICRONUTRIENT AVAILABILITY:
Your pH range: 7.5 to 8.1 (avg 7.8)

At your alkaline pH, availability changes dramatically:

Nutrient Availability Notes

NUTRIENT INTERACTIONS

NUTRIENT INTERACTIONS:
! HIGH pH LOCKOUT: At pH 7.8, Zn, Mn availability drops sharply
- Every 1 unit increase in pH reduces Zn availability by ~100x
- This explains your micronutrient deficiencies - it's chemistry, not absence
- Foliar or banded micronutrients bypass the soil chemistry problem

Crop Recommendations: Weist Farms Muddy Creek W05

Based on YOUR soil conditions - not generic advice

CROP SUITABILITY FOR THIS FIELD

! Winter Wheat: CAUTION

+ K is adequate (451 ppm) - no K fertilizer needed
! Low S (8.1 ppm) will limit protein - apply 10-15 lbs S/ac
! Low Zn (0.8 ppm) - consider seed treatment or foliar

!! Spring Wheat HP: RISKY

!! Low S (8.1 ppm) - WILL limit protein even with high N

+ Malt Barley: GOOD FIT

+ Excellent K (451 ppm) - barley loves potassium
! Low Mn (1.0 ppm) - gray speck disease risk

+ Feed Barley: GOOD FIT

+ Good K (451 ppm) - supports yield
+ Good residual N (23 ppm) - less fertilizer needed

+ Field Peas: GOOD FIT

+ Good K (451 ppm) - peas are K-efficient but appreciate it

+ Lentils: GOOD FIT

+ pH (7.8) acceptable - lentils tolerate alkaline better than peas
+ Good P (38 ppm) - lentils are P-efficient

!! Chickpeas: RISKY

! Low Fe (10.6 ppm) + high pH = chlorosis risk
! Low Zn (0.8 ppm) - affects flowering
!! HIGH pH zones (8.1) - IRON CHLOROSIS almost certain

!! Canola: RISKY

+ Good B (1.1 ppm) - supports flowering
!! Low S (8.1 ppm) - CRITICAL: canola needs 15-25 lbs S/ac

+ Alfalfa: GOOD FIT

+ pH (7.8) excellent for alfalfa - optimal nodulation range
+ Good K (451 ppm) - critical for winter hardiness

Weist Farms Truchot T05

ACRES	SAMPLE POINTS	HEALTH SCORE
228	74,320	71/100 (Good)

STRENGTHS

+ ADEQUATE ORGANIC MATTER: 100% of field has OM in normal range for Montana (1.5%+)
+ STRONG CEC: Average of 24.3 meq/100g provides good nutrient holding
+ ADEQUATE PHOSPHORUS: 68% of field has sufficient P

KEY CONCERNS

! **LOW SULFUR: 88% of field is sulfur deficient - common in Montana dryland**

PRIORITY ACTIONS

1. **Apply 10-15 lbs S/ac (88% of field deficient)**
   Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.
2. **Zn application or seed treatment (25% deficient)**
   Priority: 8/10 | At planting - banded or seed treatment
3. **Use variable rate sulfentrazone for pulse crops - INJURY RISK in some zones**
   Priority: 8/10 | Pre-plant or pre-emergence

VARIABLE RATE OPPORTUNITIES

Nutrient	Range	VRA Recommendation
Phosphorus (Bray-1)	1.0-105.0	YES - P ranges 1-105 ppm - vary rate to build low areas faster
Phosphorus (Olsen)	10.0-94.0	YES - P ranges 10-94 ppm - vary rate to build low areas faster
Potassium	192.2-876.2	YES - K ranges 192-876 ppm - target low zones
Sulfur	4.5-12.9	YES - S ranges 4-13 ppm - vary rate by zone
Zinc	0.3-6.8	YES - 25% low, ranges 0.3-6.8 ppm - target deficient zones
Manganese	1.0-13.6	YES - Mn ranges 1.0-13.6 ppm - vary rate by zone
Soil pH	7.0-8.2	YES - pH ranges 7.0 to 8.2 - vary lime rate

NUTRIENT SUMMARY

Nutrient	Avg	Range	% Deficient	% Optimal	Status
Soil pH	7.7	7.0-8.2	0%	15%	High
Organic Matter	2.2	1.6-3.0	0%	100%	Good
Phosphorus (Bray-1)	37.2	1.0-105.0	29%	48%	Good
Phosphorus (Olsen)	43.3	10.0-94.0	2%	17%	High
Potassium	491.0	192.2-876.2	0%	13%	High
Sulfur	8.8	4.5-12.9	88%	12%	Low
Zinc	1.5	0.3-6.8	25%	69%	Good
Manganese	3.0	1.0-13.6	64%	36%	Good
Copper	1.4	0.7-2.5	0%	100%	Good
Iron	64.3	11.4-365.3	0%	55%	High
Boron	1.7	0.6-5.9	0%	76%	Good
Cation Exchange Capacity	24.3	21.2-27.4	0%	79%	Good

Deeper Insights: Weist Farms Truchot T05

Advanced soil analysis and agronomic interpretation

SOIL TEXTURE

SOIL TEXTURE: LOAM (0% clay, 0% sand, 0% silt)
+ Ideal texture - balanced water/air/nutrient properties
+ Good workability across moisture conditions
+ Moderate water holding with good drainage
= Few texture-related management challenges

WATER HOLDING & DROUGHT RISK

WATER HOLDING & DROUGHT RISK:
WATER HOLDING CAPACITY: LOW
Estimated ~1.0 inches available water per foot of root depth
! HIGHER DROUGHT RISK - soil drains quickly
- Crops will stress sooner in dry spells

PH EFFECTS ON NUTRIENTS

pH EFFECTS ON MICRONUTRIENT AVAILABILITY:
Your pH range: 7.0 to 8.2 (avg 7.7)

At your alkaline pH, availability changes dramatically:

Nutrient Availability Notes

NUTRIENT INTERACTIONS

NUTRIENT INTERACTIONS:
! HIGH pH LOCKOUT: At pH 7.7, Mn availability drops sharply
- Every 1 unit increase in pH reduces Zn availability by ~100x
- This explains your micronutrient deficiencies - it's chemistry, not absence
- Foliar or banded micronutrients bypass the soil chemistry problem

Crop Recommendations: Weist Farms Truchot T05

Based on YOUR soil conditions - not generic advice

CROP SUITABILITY FOR THIS FIELD

+ Winter Wheat: GOOD FIT

+ K is adequate (491 ppm) - no K fertilizer needed
! Low S (8.8 ppm) will limit protein - apply 10-15 lbs S/ac

!! Spring Wheat HP: RISKY

!! Low S (8.8 ppm) - WILL limit protein even with high N

+ Malt Barley: GOOD FIT

+ Excellent K (491 ppm) - barley loves potassium
! Low Mn (3.0 ppm) - gray speck disease risk

+ Feed Barley: GOOD FIT

+ Good K (491 ppm) - supports yield

+ Field Peas: GOOD FIT

+ Good K (491 ppm) - peas are K-efficient but appreciate it

+ Lentils: GOOD FIT

+ pH (7.7) acceptable - lentils tolerate alkaline better than peas
+ Good P (43 ppm) - lentils are P-efficient

!! Chickpeas: RISKY

!! HIGH pH zones (8.2) - IRON CHLOROSIS almost certain

!! Canola: RISKY

+ Good B (1.7 ppm) - supports flowering
!! Low S (8.8 ppm) - CRITICAL: canola needs 15-25 lbs S/ac

+ Alfalfa: GOOD FIT

+ pH (7.7) excellent for alfalfa - optimal nodulation range
+ Good K (491 ppm) - critical for winter hardiness

Weist Farms Truchot T07

ACRES	SAMPLE POINTS	HEALTH SCORE
80	26,482	81/100 (Good)

STRENGTHS

+ EXCELLENT pH: 81% of field is in optimal pH range (6.0-7.5)
+ ADEQUATE ORGANIC MATTER: 100% of field has OM in normal range for Montana (1.5%+)
+ STRONG CEC: Average of 22.0 meq/100g provides good nutrient holding

KEY CONCERNS

! **LOW ZINC: 100% of field has Zn below 1.0 ppm - can limit yields in small grains**

PRIORITY ACTIONS

1. **Apply 3-5 lbs Zn/ac (100% deficient, avg 0.69 ppm)**
   Priority: 8/10 | Band with starter or incorporate. One application lasts 2-4 years.
2. **Use variable rate sulfentrazone for pulse crops - INJURY RISK in some zones**
   Priority: 8/10 | Pre-plant or pre-emergence

VARIABLE RATE OPPORTUNITIES

Nutrient	Range	VRA Recommendation
Phosphorus (Bray-1)	1.0-66.0	YES - P ranges 1.0-66.0 ppm - vary rate to build low areas faster
Phosphorus (Olsen)	12.4-49.9	99% adequate, min 12 ppm - maintenance only
Potassium	154.1-1099.4	YES - K ranges 154-1099 ppm - target low zones
Sulfur	6.0-49.9	YES - S ranges 6-50 ppm - vary rate by zone
Zinc	0.3-1.0	YES - All deficient but ranges 0.3-1.0 ppm - vary rate by severity
Manganese	0.7-9.1	YES - Mn ranges 0.7-9.1 ppm - vary rate by zone
Soil pH	6.3-8.3	YES - pH ranges 6.3 to 8.3 - vary lime rate

NUTRIENT SUMMARY

Nutrient	Avg	Range	% Deficient	% Optimal	Status
Soil pH	7.1	6.3-8.3	0%	81%	Good
Organic Matter	2.3	1.6-2.8	0%	100%	Good
Phosphorus (Bray-1)	39.3	1.0-66.0	19%	53%	Good
Phosphorus (Olsen)	32.4	12.4-49.9	1%	37%	High
Potassium	461.2	154.1-1099.4	1%	22%	High
Sulfur	20.3	6.0-49.9	3%	87%	Good
Zinc	0.7	0.3-1.0	100%	0%	Low
Manganese	4.8	0.7-9.1	26%	74%	Good
Copper	1.3	0.8-1.8	0%	100%	Good
Iron	37.2	5.6-78.6	0%	87%	Good
Boron	0.9	0.7-1.1	0%	100%	Good
Cation Exchange Capacity	22.0	19.9-23.5	0%	100%	Good

Deeper Insights: Weist Farms Truchot T07

Advanced soil analysis and agronomic interpretation

SOIL TEXTURE

SOIL TEXTURE: LOAM (0% clay, 0% sand, 0% silt)
+ Ideal texture - balanced water/air/nutrient properties
+ Good workability across moisture conditions
+ Moderate water holding with good drainage
= Few texture-related management challenges

WATER HOLDING & DROUGHT RISK

WATER HOLDING & DROUGHT RISK:
WATER HOLDING CAPACITY: LOW
Estimated ~1.0 inches available water per foot of root depth
! HIGHER DROUGHT RISK - soil drains quickly
- Crops will stress sooner in dry spells

PH EFFECTS ON NUTRIENTS

pH EFFECTS ON MICRONUTRIENT AVAILABILITY:
Your pH range: 6.3 to 8.3 (avg 7.1)

NUTRIENT INTERACTIONS

NUTRIENT INTERACTIONS:
* HIGH MAGNESIUM (26% base saturation):

Crop Recommendations: Weist Farms Truchot T07

Based on YOUR soil conditions - not generic advice

CROP SUITABILITY FOR THIS FIELD

+ Winter Wheat: GOOD FIT

+ K is adequate (461 ppm) - no K fertilizer needed
+ pH (7.1) optimal for nutrient uptake
! Low Zn (0.7 ppm) - consider seed treatment or foliar

+ Spring Wheat HP: GOOD FIT

+ S adequate (20.3 ppm) - supports protein development

+ Malt Barley: GOOD FIT

+ Excellent K (461 ppm) - barley loves potassium
! Low Mn (4.8 ppm) - gray speck disease risk

+ Feed Barley: GOOD FIT

+ Good K (461 ppm) - supports yield

+ Field Peas: GOOD FIT

+ Optimal pH (7.1) for nodulation
+ Good K (461 ppm) - peas are K-efficient but appreciate it

+ Lentils: GOOD FIT

+ pH (7.1) acceptable - lentils tolerate alkaline better than peas
+ Good P (32 ppm) - lentils are P-efficient
! Low Zn (0.7 ppm) - affects seed fill

!! Chickpeas: RISKY

+ pH (7.1) in acceptable range
! Low Zn (0.7 ppm) - affects flowering
!! HIGH pH zones (8.3) - IRON CHLOROSIS almost certain

+ Canola: GOOD FIT

+ Excellent S (20.3 ppm) - canola's #1 need is covered!

+ Alfalfa: GOOD FIT

+ pH (7.1) excellent for alfalfa - optimal nodulation range
+ Good K (461 ppm) - critical for winter hardiness

Weist Farms Truchot T09

ACRES	SAMPLE POINTS	HEALTH SCORE
234	78,026	74/100 (Good)

STRENGTHS

+ ADEQUATE ORGANIC MATTER: 68% of field has OM in normal range for Montana (1.5%+)
+ STRONG CEC: Average of 22.1 meq/100g provides good nutrient holding
+ ADEQUATE PHOSPHORUS: 65% of field has sufficient P

KEY CONCERNS

! **LOW PHOSPHORUS: 35% of field is below optimal P levels (17.1 ppm avg)**
! **LOW SULFUR: 100% of field is sulfur deficient - common in Montana dryland**
! **LOW ZINC: 100% of field has Zn below 1.0 ppm - can limit yields in small grains**

PRIORITY ACTIONS

1. **Apply 10-15 lbs S/ac (100% of field deficient)**
   Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.
2. **Apply 3-5 lbs Zn/ac (100% deficient, avg 0.53 ppm)**
   Priority: 8/10 | Band with starter or incorporate. One application lasts 2-4 years.
3. **Use variable rate sulfentrazone for pulse crops - INJURY RISK in some zones**
   Priority: 8/10 | Pre-plant or pre-emergence
4. **Variable rate P application - P ranges 8-31 ppm - vary rate to build low areas faster**
   Priority: 5/10 | Fall broadcast or spring banding. MSU: band for better efficiency

VARIABLE RATE OPPORTUNITIES

Nutrient	Range	VRA Recommendation
Phosphorus (Bray-1)	0.2-57.2	YES - P ranges 0.2-57.2 ppm - vary rate to build low areas faster
Phosphorus (Olsen)	8.0-31.4	YES - P ranges 8-31 ppm - vary rate to build low areas faster
Potassium	175.5-563.0	YES - K ranges 175-563 ppm - target low zones
Sulfur	3.5-5.4	S is uniform (3-5 ppm) - flat rate 10-15 lbs/ac
Zinc	0.2-0.9	YES - All deficient but ranges 0.2-0.9 ppm - vary rate by severity
Manganese	1.9-8.7	YES - Mn ranges 2-9 ppm - vary rate by zone
Soil pH	6.6-8.4	YES - pH ranges 6.6 to 8.4 - vary lime rate

NUTRIENT SUMMARY

Nutrient	Avg	Range	% Deficient	% Optimal	Status
Soil pH	7.5	6.6-8.4	0%	56%	Good
Organic Matter	1.6	0.9-2.1	32%	68%	Good
Phosphorus (Bray-1)	28.9	0.2-57.2	36%	63%	Good
Phosphorus (Olsen)	17.1	8.0-31.4	35%	65%	Good
Potassium	382.6	175.5-563.0	0%	34%	High
Sulfur	4.6	3.5-5.4	100%	0%	Critical
Zinc	0.5	0.2-0.9	100%	0%	Low
Manganese	4.6	1.9-8.7	1%	99%	Good
Copper	1.2	0.8-1.6	0%	100%	Good
Iron	14.4	10.4-22.0	0%	100%	Good
Boron	0.8	0.4-1.2	0%	100%	Good
Cation Exchange Capacity	22.1	17.7-28.2	0%	95%	Good

Deeper Insights: Weist Farms Truchot T09

Advanced soil analysis and agronomic interpretation

SOIL TEXTURE

SOIL TEXTURE: HEAVY CLAY (43% clay, 30% sand, 27% silt)
+ Excellent water holding capacity - holds moisture through dry spells
+ High nutrient retention - fertilizer stays put, less leaching
+ High CEC potential - can hold more cations (Ca, Mg, K)
- Prone to compaction - avoid working when wet

WATER HOLDING & DROUGHT RISK

WATER HOLDING & DROUGHT RISK:
WATER HOLDING CAPACITY: HIGH
Estimated ~2.0 inches available water per foot of root depth
+ This soil stores moisture well - better drought buffer than sandier soils
+ Can 'bank' moisture from fall/winter precipitation

PH EFFECTS ON NUTRIENTS

pH EFFECTS ON MICRONUTRIENT AVAILABILITY:
Your pH range: 6.6 to 8.4 (avg 7.5)

NUTRIENT INTERACTIONS

NUTRIENT INTERACTIONS:
* HIGH MAGNESIUM (21% base saturation):
* SULFUR NOTE: Low S (4.6 ppm) in alkaline soil is common
- Sulfate leaches easily in high-pH soils
- Annual S application recommended for responsive crops

Crop Recommendations: Weist Farms Truchot T09

Based on YOUR soil conditions - not generic advice

CROP SUITABILITY FOR THIS FIELD

+ Winter Wheat: GOOD FIT

+ K is adequate (383 ppm) - no K fertilizer needed
+ pH (7.5) optimal for nutrient uptake
! Low S (4.6 ppm) will limit protein - apply 10-15 lbs S/ac
! Low Zn (0.5 ppm) - consider seed treatment or foliar

!! Spring Wheat HP: RISKY

!! Low S (4.6 ppm) - WILL limit protein even with high N

! Malt Barley: CAUTION

+ Excellent K (383 ppm) - barley loves potassium
! Low S (4.6 ppm) may affect plumpness
! Low Mn (4.6 ppm) - gray speck disease risk

+ Feed Barley: GOOD FIT

+ Good K (383 ppm) - supports yield
! Low Zn (0.5 ppm) - may reduce tillering

+ Field Peas: GOOD FIT

+ Optimal pH (7.5) for nodulation
+ Good K (383 ppm) - peas are K-efficient but appreciate it
! Low S (4.6 ppm) - affects protein synthesis

+ Lentils: GOOD FIT

+ pH (7.5) acceptable - lentils tolerate alkaline better than peas
+ Good P (17 ppm) - lentils are P-efficient
! Low Zn (0.5 ppm) - affects seed fill

!! Chickpeas: RISKY

+ pH (7.5) in acceptable range
! Low Fe (14.4 ppm) + high pH = chlorosis risk
! Low Zn (0.5 ppm) - affects flowering
!! HIGH pH zones (8.4) - IRON CHLOROSIS almost certain

!! Canola: RISKY

!! Low S (4.6 ppm) - CRITICAL: canola needs 15-25 lbs S/ac

+ Alfalfa: GOOD FIT

+ pH (7.5) excellent for alfalfa - optimal nodulation range
+ Good K (383 ppm) - critical for winter hardiness
! Low S (4.6 ppm) - affects protein, apply 15-20 lbs S/ac
! Marginal B (0.8 ppm) - apply 1-2 lbs B/ac (do not exceed 2 lbs)

Weist Farms Weist W02

ACRES	SAMPLE POINTS	HEALTH SCORE
242	68,197	74/100 (Good)

STRENGTHS

+ ADEQUATE ORGANIC MATTER: 100% of field has OM in normal range for Montana (1.5%+)
+ STRONG CEC: Average of 25.4 meq/100g provides good nutrient holding
+ ADEQUATE PHOSPHORUS: 54% of field has sufficient P

KEY CONCERNS

! **HIGH SOIL pH: 46% of field has pH above 8.0, reducing micronutrient availability**
! **LOW PHOSPHORUS: 44% of field is below optimal P levels (20.1 ppm avg)**

PRIORITY ACTIONS

1 **Use variable rate sulfentrazone for pulse crops - INJURY RISK in some zones**
Priority: 8/10 | Pre-plant or pre-emergence

2 **Variable rate P application - P ranges 9-77 ppm - vary rate to build low areas faster**
Priority: 5/10 | Fall broadcast or spring banding. MSU: band for better efficiency

VARIABLE RATE OPPORTUNITIES

Nutrient	Range	VRA Recommendation
Phosphorus (Bray-1)	0.0-97.0	YES - P ranges 0.0-97.0 ppm - vary rate to build low areas faster
Phosphorus (Olsen)	9.2-77.0	YES - P ranges 9-77 ppm - vary rate to build low areas faster
Potassium	169.9-1105.8	YES - K ranges 170-1106 ppm - target low zones
Sulfur	13.7-291.1	S adequate across field (14-291 ppm) - no S application needed
Zinc	0.5-3.6	YES - 18% low, ranges 0.5-3.6 ppm - target deficient zones
Manganese	1.8-7.7	YES - Mn ranges 2-8 ppm - vary rate by zone
Soil pH	6.9-8.5	YES - pH ranges 6.9 to 8.5 - vary lime rate

NUTRIENT SUMMARY

Nutrient	Avg	Range	% Deficient	% Optimal	Status
Soil pH	8.0	6.9-8.5	0%	4%	High
Organic Matter	2.4	1.9-3.1	0%	100%	Good
Phosphorus (Bray-1)	34.1	0.0-97.0	35%	49%	Good
Phosphorus (Olsen)	20.1	9.2-77.0	44%	44%	Good
Potassium	470.9	169.9-1105.8	2%	25%	High
Sulfur	46.8	13.7-291.1	0%	38%	High
Zinc	1.4	0.5-3.6	18%	80%	Good
Manganese	3.8	1.8-7.7	12%	88%	Good
Copper	1.9	0.6-4.0	0%	88%	Good
Iron	35.0	3.6-111.2	0%	85%	Good
Boron	1.4	0.6-3.0	0%	94%	Good
Cation Exchange Capacity	25.4	22.7-30.9	0%	39%	High

Deeper Insights: Weist Farms Weist W02

Advanced soil analysis and agronomic interpretation

WATER HOLDING & DROUGHT RISK

WATER HOLDING & DROUGHT RISK:
  WATER HOLDING CAPACITY: MODERATE
    Estimated ~1.5 inches available water per foot of root depth
  CEC of 25 suggests good water holding (high CEC = more clay/OM)

PH EFFECTS ON NUTRIENTS

pH EFFECTS ON MICRONUTRIENT AVAILABILITY:
  Your pH range: 6.9 to 8.5 (avg 8.0)

  At your alkaline pH, availability changes dramatically:

    Nutrient Availability Notes

NUTRIENT INTERACTIONS

NUTRIENT INTERACTIONS:
  ! HIGH pH LOCKOUT: At pH 8.0, Mn availability drops sharply
    - Every 1 unit increase in pH reduces Zn availability by ~100x
    - This explains your micronutrient deficiencies - it's chemistry, not absence
    - Foliar or banded micronutrients bypass the soil chemistry problem

Crop Recommendations: Weist Farms Weist W02

Based on YOUR soil conditions - not generic advice

CROP SUITABILITY FOR THIS FIELD

+ Winter Wheat: GOOD FIT

+ K is adequate (471 ppm) - no K fertilizer needed
! Mn may be locked up at pH 8.0 - watch for chlorosis

+ Spring Wheat HP: GOOD FIT

+ S adequate (46.8 ppm) - supports protein development

+ Malt Barley: GOOD FIT

+ Excellent K (471 ppm) - barley loves potassium
! Low Mn (3.8 ppm) - gray speck disease risk

+ Feed Barley: GOOD FIT

+ Good K (471 ppm) - supports yield
+ Good residual N (30 ppm) - less fertilizer needed

+ Field Peas: GOOD FIT

+ Good K (471 ppm) - peas are K-efficient but appreciate it

+ Lentils: GOOD FIT

+ pH (8.0) acceptable - lentils tolerate alkaline better than peas
+ Good P (20 ppm) - lentils are P-efficient

!! Chickpeas: RISKY

!! HIGH pH zones (8.5) - IRON CHLOROSIS almost certain
!! Average pH 8.0 too high - consider lentils or peas instead

+ Canola: GOOD FIT

+ Excellent S (46.8 ppm) - canola's #1 need is covered!
+ Good B (1.4 ppm) - supports flowering

+ Alfalfa: GOOD FIT

+ Good K (471 ppm) - critical for winter hardiness
+ Good P (20 ppm) - supports root development
! High pH (8.0) - Fe/Zn uptake may be reduced

Weist Farms Weist W03

ACRES	SAMPLE POINTS	HEALTH SCORE
54	15,425	74/100 (Good)

STRENGTHS

+ ADEQUATE ORGANIC MATTER: 100% of field has OM in normal range for Montana (1.5%+)
+ STRONG CEC: Average of 25.1 meq/100g provides good nutrient holding
+ STRONG POTASSIUM: 100% of field has adequate K

KEY CONCERNS

! **LOW SULFUR: 44% of field is sulfur deficient - common in Montana dryland**

PRIORITY ACTIONS

1 **Apply 10-15 lbs S/ac (44% of field deficient)**

Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.

2 **Apply 2-5 lbs Mn/ac (96% deficient, avg 2.4 ppm)**

Priority: 5/10 | Band with starter, or foliar at tillering. NOT broadcast.

VARIABLE RATE OPPORTUNITIES

Nutrient	Range	VRA Recommendation
Phosphorus (Bray-1)	21.1-65.1	100% adequate, min 21 ppm - maintenance only
Phosphorus (Olsen)	37.2-77.0	100% adequate, min 37 ppm - maintenance only
Potassium	617.6-926.0	K is adequate across field (min 618 ppm) - maintain
Sulfur	4.2-32.5	YES - S ranges 4-32 ppm - vary rate by zone
Zinc	0.9-1.7	Most of field has adequate Zn (min 0.9 ppm)
Manganese	2.0-3.3	Mn is uniform (2-3 ppm) - flat rate if needed
Soil pH	7.7-8.0	pH is uniform (8-8) - flat rate if needed

NUTRIENT SUMMARY

Nutrient	Avg	Range	% Deficient	% Optimal	Status
Soil pH	7.8	7.7-8.0	0%	0%	High
Organic Matter	2.7	2.2-3.7	0%	100%	Good
Phosphorus (Bray-1)	41.8	21.1-65.1	0%	84%	Good
Phosphorus (Olsen)	60.6	37.2-77.0	0%	0%	High
Potassium	759.5	617.6-926.0	0%	0%	High
Sulfur	11.9	4.2-32.5	44%	56%	Good
Zinc	1.1	0.9-1.7	14%	86%	Good
Manganese	2.4	2.0-3.3	96%	4%	Low
Copper	1.7	1.1-3.3	0%	95%	Good
Iron	16.6	12.1-25.6	0%	100%	Good
Boron	1.2	1.1-1.6	0%	100%	Good
Cation Exchange Capacity	25.1	21.6-31.7	0%	51%	High

Deeper Insights: Weist Farms Weist W03

Advanced soil analysis and agronomic interpretation

SOIL TEXTURE

SOIL TEXTURE: LOAM (0% clay, 0% sand, 0% silt)
+ Ideal texture - balanced water/air/nutrient properties
+ Good workability across moisture conditions
+ Moderate water holding with good drainage
= Few texture-related management challenges

WATER HOLDING & DROUGHT RISK

WATER HOLDING & DROUGHT RISK:
WATER HOLDING CAPACITY: LOW
Estimated ~1.0 inches available water per foot of root depth
! HIGHER DROUGHT RISK - soil drains quickly
- Crops will stress sooner in dry spells

PH EFFECTS ON NUTRIENTS

pH EFFECTS ON MICRONUTRIENT AVAILABILITY:
Your pH range: 7.7 to 8.0 (avg 7.8)

At your alkaline pH, availability changes dramatically:

Nutrient Availability Notes

NUTRIENT INTERACTIONS

NUTRIENT INTERACTIONS:
! HIGH pH LOCKOUT: At pH 7.8, Mn availability drops sharply
- Every 1 unit increase in pH reduces Zn availability by ~100x
- This explains your micronutrient deficiencies - it's chemistry, not absence
- Foliar or banded micronutrients bypass the soil chemistry problem

Crop Recommendations: Weist Farms Weist W03

Based on YOUR soil conditions - not generic advice

CROP SUITABILITY FOR THIS FIELD

+ Winter Wheat: GOOD FIT

+ K is adequate (759 ppm) - no K fertilizer needed
! Mn may be locked up at pH 7.8 - watch for chlorosis

+ Spring Wheat HP: GOOD FIT

+ Good OM (2.7%) provides season-long N release

+ Malt Barley: GOOD FIT

+ Excellent K (759 ppm) - barley loves potassium
! Low Mn (2.4 ppm) - gray speck disease risk

+ Feed Barley: GOOD FIT

+ Good K (759 ppm) - supports yield
+ Good residual N (23 ppm) - less fertilizer needed

+ Field Peas: GOOD FIT

+ Good K (759 ppm) - peas are K-efficient but appreciate it

+ Lentils: GOOD FIT

+ pH (7.8) acceptable - lentils tolerate alkaline better than peas
+ Good P (61 ppm) - lentils are P-efficient

!! Chickpeas: RISKY

!! Average pH 7.8 too high - consider lentils or peas instead

!! Canola: RISKY

+ Good B (1.2 ppm) - supports flowering
+ Good OM (2.7%) - helps with heavy N demand
!! Low S (11.9 ppm) - CRITICAL: canola needs 15-25 lbs S/ac

+ Alfalfa: GOOD FIT

+ Good K (759 ppm) - critical for winter hardiness
+ Good P (61 ppm) - supports root development
! High pH (7.8) - Fe/Zn uptake may be reduced

Weist Farms Weist W07

ACRES	SAMPLE POINTS	HEALTH SCORE
69	21,944	74/100 (Good)

STRENGTHS

+ EXCELLENT pH: 87% of field is in optimal pH range (6.0-7.5)
+ ADEQUATE ORGANIC MATTER: 86% of field has OM in normal range for Montana (1.5%+)
+ STRONG CEC: Average of 20.3 meq/100g provides good nutrient holding

KEY CONCERNS

! **LOW SULFUR: 100% of field is sulfur deficient - common in Montana dryland**
! **LOW ZINC: 100% of field has Zn below 1.0 ppm - can limit yields in small grains**

PRIORITY ACTIONS

1. **Apply 10-15 lbs S/ac (100% of field deficient)**
   Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.
2. **Apply 3-5 lbs Zn/ac (100% deficient, avg 0.53 ppm)**
   Priority: 8/10 | Band with starter or incorporate. One application lasts 2-4 years.
3. **Use variable rate sulfentrazone for pulse crops - INJURY RISK in some zones**
   Priority: 8/10 | Pre-plant or pre-emergence

VARIABLE RATE OPPORTUNITIES

Nutrient	Range	VRA Recommendation
Phosphorus (Bray-1)	2.6-83.0	YES - P ranges 3-83 ppm - vary rate to build low areas faster
Potassium	154.0-787.5	YES - K ranges 154-788 ppm - target low zones
Sulfur	3.6-9.4	YES - S ranges 4-9 ppm - vary rate by zone
Zinc	0.1-1.0	YES - All deficient but ranges 0.1-1.0 ppm - vary rate by severity
Manganese	2.8-10.0	Mn adequate across field (min 2.8 ppm)
Soil pH	6.1-8.2	YES - pH ranges 6.1 to 8.2 - vary lime rate

NUTRIENT SUMMARY

Nutrient	Avg	Range	% Deficient	% Optimal	Status
Soil pH	7.0	6.1-8.2	0%	87%	Good
Organic Matter	1.8	1.1-2.6	14%	86%	Good
Phosphorus (Bray-1)	46.3	2.6-83.0	10%	48%	Good
Potassium	394.7	154.0-787.5	4%	34%	High
Sulfur	6.6	3.6-9.4	100%	0%	Low
Zinc	0.5	0.1-1.0	100%	0%	Low
Manganese	6.5	2.8-10.0	0%	100%	Good
Copper	1.4	0.6-2.2	0%	100%	Good
Iron	25.2	7.0-42.0	0%	100%	Good
Boron	0.7	0.6-0.8	0%	100%	Good
Cation Exchange Capacity	20.3	18.2-23.1	0%	100%	Good

Deeper Insights: Weist Farms Weist W07

Advanced soil analysis and agronomic interpretation

SOIL TEXTURE

SOIL TEXTURE: CLAY LOAM (39% clay, 39% sand, 23% silt)
+ Good balance of water holding and drainage
+ Moderate nutrient retention
+ Workable texture for most operations
- Still watch for compaction in wet conditions

WATER HOLDING & DROUGHT RISK

WATER HOLDING & DROUGHT RISK:
WATER HOLDING CAPACITY: MODERATE-HIGH
Estimated ~1.8 inches available water per foot of root depth
+ This soil stores moisture well - better drought buffer than sandier soils
+ Can 'bank' moisture from fall/winter precipitation

PH EFFECTS ON NUTRIENTS

pH EFFECTS ON MICRONUTRIENT AVAILABILITY:
Your pH range: 6.1 to 8.2 (avg 7.0)

NUTRIENT INTERACTIONS

NUTRIENT INTERACTIONS:
* HIGH MAGNESIUM (24% base saturation):
* SULFUR NOTE: Low S (6.6 ppm) in alkaline soil is common
- Sulfate leaches easily in high-pH soils
- Annual S application recommended for responsive crops

Crop Recommendations: Weist Farms Weist W07

Based on YOUR soil conditions - not generic advice

CROP SUITABILITY FOR THIS FIELD

! Winter Wheat: CAUTION

+ K is adequate (395 ppm) - no K fertilizer needed
+ pH (7.0) optimal for nutrient uptake
! Low S (6.6 ppm) will limit protein - apply 10-15 lbs S/ac
! Low Zn (0.5 ppm) - consider seed treatment or foliar

!! Spring Wheat HP: RISKY

! Low P (0 ppm) - affects early tillering
!! Low S (6.6 ppm) - WILL limit protein even with high N

+ Malt Barley: GOOD FIT

+ Excellent K (395 ppm) - barley loves potassium
! Low S (6.6 ppm) may affect plumpness

+ Feed Barley: GOOD FIT

+ Good K (395 ppm) - supports yield
! Low Zn (0.5 ppm) - may reduce tillering

+ Field Peas: GOOD FIT

+ Optimal pH (7.0) for nodulation
+ Good K (395 ppm) - peas are K-efficient but appreciate it
! Low S (6.6 ppm) - affects protein synthesis

+ Lentils: GOOD FIT

+ pH (7.0) acceptable - lentils tolerate alkaline better than peas
! Low Zn (0.5 ppm) - affects seed fill

!! Chickpeas: RISKY

+ pH (7.0) in acceptable range
! Low Zn (0.5 ppm) - affects flowering
!! HIGH pH zones (8.2) - IRON CHLOROSIS almost certain

!! Canola: RISKY

! Low B (0.7 ppm) - apply 0.5-1 lb B/ac
!! Low S (6.6 ppm) - CRITICAL: canola needs 15-25 lbs S/ac

! Alfalfa: CAUTION

+ pH (7.0) excellent for alfalfa - optimal nodulation range
+ Good K (395 ppm) - critical for winter hardiness
! Low P (0 ppm) - apply 40-60 lbs P_2O_5/ac preplant
! Low S (6.6 ppm) - affects protein, apply 15-20 lbs S/ac

Weist Farms Zier Z02

ACRES	SAMPLE POINTS	HEALTH SCORE
377	125,286	71/100 (Good)

STRENGTHS

+ ADEQUATE ORGANIC MATTER: 100% of field has OM in normal range for Montana (1.5%+)
+ STRONG CEC: Average of 21.9 meq/100g provides good nutrient holding
+ ADEQUATE PHOSPHORUS: 99% of field has sufficient P

KEY CONCERNS

! **LOW SULFUR: 100% of field is sulfur deficient - common in Montana dryland**
! **LOW ZINC: 100% of field has Zn below 1.0 ppm - can limit yields in small grains**

PRIORITY ACTIONS

1. **Apply 10-15 lbs S/ac (100% of field deficient)**
   Priority: 9/10 | Fall or early spring. Ammonium sulfate provides immediate availability.
2. **Apply 3-5 lbs Zn/ac (100% deficient, avg 0.57 ppm)**
   Priority: 8/10 | Band with starter or incorporate. One application lasts 2-4 years.
3. **Use variable rate sulfentrazone for pulse crops - INJURY RISK in some zones**
   Priority: 8/10 | Pre-plant or pre-emergence
4. **Apply 2-5 lbs Mn/ac (100% deficient, avg 1.4 ppm)**
   Priority: 5/10 | Band with starter, or foliar at tillering. NOT broadcast.

VARIABLE RATE OPPORTUNITIES

Nutrient	Range	VRA Recommendation
Phosphorus (Bray-1)	1.6-54.8	YES - P ranges 2-55 ppm - vary rate to build low areas faster
Phosphorus (Olsen)	12.7-42.9	99% adequate, min 13 ppm - maintenance only
Potassium	355.4-557.8	K is adequate across field (min 355 ppm) - maintain
Zinc	0.3-0.7	Zn is uniform (0.3-0.7 ppm) - flat rate application
Manganese	0.8-2.3	Mn is uniform (0.8-2.3 ppm) - flat rate if needed
Soil pH	7.6-8.0	pH is uniform (8-8) - flat rate if needed

NUTRIENT SUMMARY

Nutrient	Avg	Range	% Deficient	% Optimal	Status
Soil pH	7.8	7.6-8.0	0%	0%	High
Organic Matter	1.8	1.6-2.0	0%	100%	Good
Phosphorus (Bray-1)	22.6	1.6-54.8	60%	39%	Low
Phosphorus (Olsen)	27.1	12.7-42.9	1%	75%	Good
Potassium	432.1	355.4-557.8	0%	0%	High
Zinc	0.6	0.3-0.7	100%	0%	Low
Manganese	1.4	0.8-2.3	100%	0%	Low
Copper	1.2	0.9-1.5	0%	100%	Good
Iron	11.7	9.2-14.6	0%	100%	Good
Boron	0.9	0.5-1.4	0%	100%	Good
Cation Exchange Capacity	21.9	18.9-26.2	0%	96%	Good

Deeper Insights: Weist Farms Zier Z02

Advanced soil analysis and agronomic interpretation

SOIL TEXTURE

SOIL TEXTURE: LOAM (0% clay, 0% sand, 0% silt)
+ Ideal texture - balanced water/air/nutrient properties
+ Good workability across moisture conditions
+ Moderate water holding with good drainage
= Few texture-related management challenges

WATER HOLDING & DROUGHT RISK

WATER HOLDING & DROUGHT RISK:
WATER HOLDING CAPACITY: LOW
Estimated ~1.0 inches available water per foot of root depth
! HIGHER DROUGHT RISK - soil drains quickly
- Crops will stress sooner in dry spells

PH EFFECTS ON NUTRIENTS

pH EFFECTS ON MICRONUTRIENT AVAILABILITY:
Your pH range: 7.6 to 8.0 (avg 7.8)

At your alkaline pH, availability changes dramatically:

Nutrient Availability Notes

NUTRIENT INTERACTIONS

NUTRIENT INTERACTIONS:
! HIGH pH LOCKOUT: At pH 7.8, Zn, Mn availability drops sharply
- Every 1 unit increase in pH reduces Zn availability by ~100x
- This explains your micronutrient deficiencies - it's chemistry, not absence
- Foliar or banded micronutrients bypass the soil chemistry problem

Crop Recommendations: Weist Farms Zier Z02

Based on YOUR soil conditions - not generic advice

CROP SUITABILITY FOR THIS FIELD

! Winter Wheat: CAUTION

+ K is adequate (432 ppm) - no K fertilizer needed
! Low S (0.0 ppm) will limit protein - apply 10-15 lbs S/ac
! Low Zn (0.6 ppm) - consider seed treatment or foliar

!! Spring Wheat HP: RISKY

!! Low S (0.0 ppm) - WILL limit protein even with high N

! Malt Barley: CAUTION

+ Excellent K (432 ppm) - barley loves potassium
! Low S (0.0 ppm) may affect plumpness
! Low Mn (1.4 ppm) - gray speck disease risk

+ Feed Barley: GOOD FIT

+ Good K (432 ppm) - supports yield
! Low Zn (0.6 ppm) - may reduce tillering

+ Field Peas: GOOD FIT

+ Good K (432 ppm) - peas are K-efficient but appreciate it
! Low S (0.0 ppm) - affects protein synthesis

+ Lentils: GOOD FIT

+ pH (7.8) acceptable - lentils tolerate alkaline better than peas
+ Good P (27 ppm) - lentils are P-efficient
! Low Zn (0.6 ppm) - affects seed fill

!! Chickpeas: RISKY

! Low Fe (11.7 ppm) + high pH = chlorosis risk
! Low Zn (0.6 ppm) - affects flowering
!! HIGH pH zones (8.0) - IRON CHLOROSIS almost certain

!! Canola: RISKY

!! Low S (0.0 ppm) - CRITICAL: canola needs 15-25 lbs S/ac

+ Alfalfa: GOOD FIT

+ pH (7.8) excellent for alfalfa - optimal nodulation range
+ Good K (432 ppm) - critical for winter hardiness
! Low S (0.0 ppm) - affects protein, apply 15-20 lbs S/ac

Weist Farms Zier Z09

ACRES	SAMPLE POINTS	HEALTH SCORE
303	69,672	82/100 (Good)

STRENGTHS

+ EXCELLENT pH: 77% of field is in optimal pH range (6.0-7.5)
+ ADEQUATE ORGANIC MATTER: 100% of field has OM in normal range for Montana (1.5%+)
+ STRONG CEC: Average of 18.1 meq/100g provides good nutrient holding

KEY CONCERNS

PRIORITY ACTIONS

1 **Use variable rate sulfentrazone for pulse crops - INJURY RISK in some zones**

Priority: 8/10 | Pre-plant or pre-emergence

VARIABLE RATE OPPORTUNITIES

Nutrient	Range	VRA Recommendation
Phosphorus (Bray-1)	2.9-66.0	YES - P ranges 3-66 ppm - vary rate to build low areas faster
Phosphorus (Olsen)	25.1-31.0	100% adequate, min 25 ppm - maintenance only
Potassium	321.6-734.3	K is adequate across field (min 322 ppm) - maintain
Sulfur	6.8-216.4	YES - S ranges 7-216 ppm - vary rate by zone
Soil pH	6.4-8.4	YES - pH ranges 6.4 to 8.4 - vary lime rate

NUTRIENT SUMMARY

Nutrient	Avg	Range	% Deficient	% Optimal	Status
Soil pH	7.2	6.4-8.4	0%	77%	Good
Organic Matter	2.1	1.5-3.0	0%	100%	Good
Phosphorus (Bray-1)	36.9	2.9-66.0	21%	59%	Good
Phosphorus (Olsen)	29.0	25.1-31.0	0%	82%	Good
Potassium	500.1	321.6-734.3	0%	3%	High
Sulfur	46.4	6.8-216.4	0%	29%	High
Cation Exchange Capacity	18.1	14.3-23.5	0%	100%	Good

Deeper Insights: Weist Farms Zier Z09

Advanced soil analysis and agronomic interpretation

SOIL TEXTURE

SOIL TEXTURE: LOAM (0% clay, 0% sand, 0% silt)
  + Ideal texture - balanced water/air/nutrient properties
  + Good workability across moisture conditions
  + Moderate water holding with good drainage
  = Few texture-related management challenges

WATER HOLDING & DROUGHT RISK

WATER HOLDING & DROUGHT RISK:
  WATER HOLDING CAPACITY: LOW
    Estimated ~1.0 inches available water per foot of root depth
    ! HIGHER DROUGHT RISK - soil drains quickly
    - Crops will stress sooner in dry spells

PH EFFECTS ON NUTRIENTS

pH EFFECTS ON MICRONUTRIENT AVAILABILITY:
  Your pH range: 6.4 to 8.4 (avg 7.2)

NUTRIENT INTERACTIONS

NUTRIENT INTERACTIONS:
  * HIGH MAGNESIUM (28% base saturation):

Crop Recommendations: Weist Farms Zier Z09

Based on YOUR soil conditions - not generic advice

CROP SUITABILITY FOR THIS FIELD

+ Winter Wheat: GOOD FIT

+ K is adequate (500 ppm) - no K fertilizer needed
+ pH (7.2) optimal for nutrient uptake

+ Spring Wheat HP: GOOD FIT

+ S adequate (46.4 ppm) - supports protein development

+ Malt Barley: GOOD FIT

+ Excellent K (500 ppm) - barley loves potassium

+ Feed Barley: GOOD FIT

+ Good K (500 ppm) - supports yield

+ Field Peas: GOOD FIT

+ Optimal pH (7.2) for nodulation
+ Good K (500 ppm) - peas are K-efficient but appreciate it

+ Lentils: GOOD FIT

+ pH (7.2) acceptable - lentils tolerate alkaline better than peas
+ Good P (29 ppm) - lentils are P-efficient

!! Chickpeas: RISKY

+ pH (7.2) in acceptable range
!! HIGH pH zones (8.4) - IRON CHLOROSIS almost certain

+ Canola: GOOD FIT

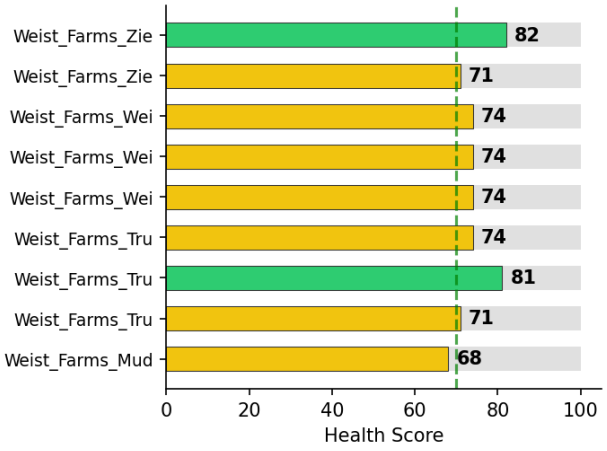
+ Excellent S (46.4 ppm) - canola's #1 need is covered!

+ Alfalfa: GOOD FIT

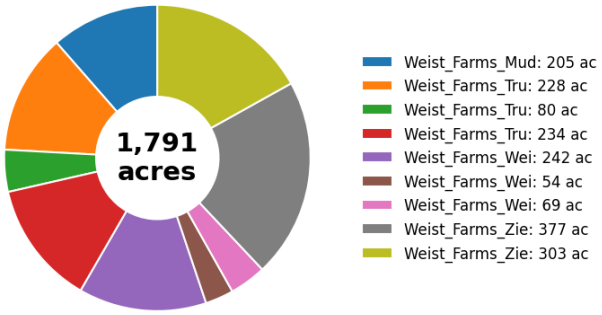
+ pH (7.2) excellent for alfalfa - optimal nodulation range
+ Good K (500 ppm) - critical for winter hardiness

FARM DASHBOARD

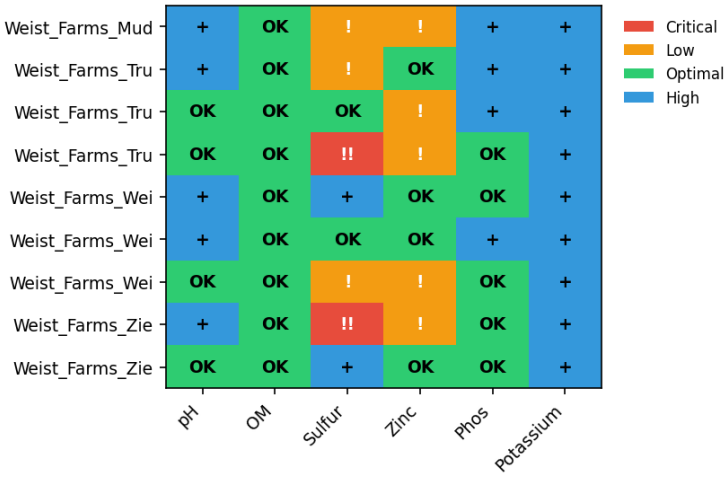
Field Health Scores



Acreage Distribution



Nutrient Status Heatmap



Nutrient Deficiencies by Field

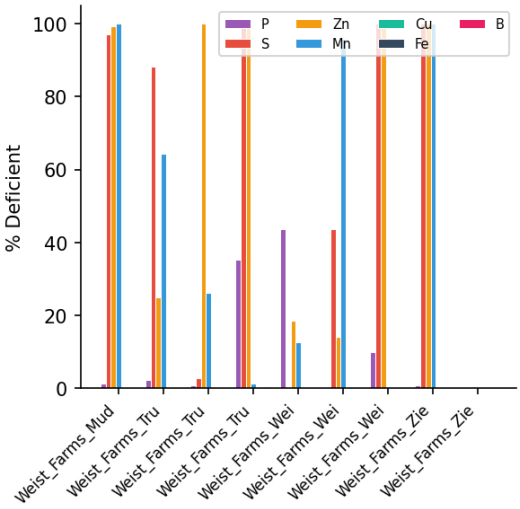


Chart error: [WinError 32] The process cannot access the file because it is being used by another process: 'C:\\Users\\doug\\AppData\\Local\\Temp\\tmpz5fj5ifi.png'

Report generated by FarmTech Variable Rate Prescriptions. Thresholds based on MSU Extension guidelines (EB0161, MT200702AG). For integration with FarmIQ or questions, contact your FarmTech advisor.