Fertilizer Optimization Initiative
Supplier Toolkit

May 2013

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INTRODUCTION

Context

- Your buyer has set a sustainability goal to drive fertilizer optimization.
- Your Sustainability Index scorecard has identified on-farm efficiency as a key improvement opportunity worth up to a 25-point increase, on average.
- Due to high levels of disaggregation and existing efficiencies, success in this space requires collaboration across categories and at every stage of the supply chain. No buyer, supplier or category can address this challenge alone.
- Walmart remains committed to many industry-led efforts, such as Field to Market, however our ambitions in sustainability require we catalyze action in concert.
  - Further, there are additional areas that might create value and also other positive environmental outcomes and this effort is not intended to be a solution for sustainable grain. We believe nitrogen is a good place to start because it is more easily quantitative and costly.
- This toolkit was created to help suppliers support their buyers in this initiative and provide clear guidance and resources to drive results.

Objective

Building on farmers' strong heritage of land stewardship, Walmart will partner with suppliers to stimulate demand for scale commodity crop production systems, practices, and technologies to continuously improve nutrient use efficiency that:

(1) Secure supply for our customers;
(2) Optimize cost of goods for farmers & the supply chain; and
(3) Create healthy soils while reducing nutrient loss to the air & water.

This work will leverage Walmart's scale to convene and empower the entire commodity agriculture supply chain to achieve systemic change.

Expectations & Success

What's in:

- Efficiency,
- Supply security,
- Risk management,
- Continuous improvement,
- Celebrating success of the American farmer

What's out:

- Walmart is not a fertilizer expert,
- We are not prescribing solutions,
- We are not driving up costs

We expect suppliers to:

- Demonstrate leadership and leverage their core competencies.
- Align with our business on the right outcomes. You know your business best and the right way to implement.
- Create, communicate, and execute a plan to begin to drive results.

Step-By-Step Guide

	Task	Due
1.	Buyers review guidance and the Supplier Toolkit (this deck).	6/1/13
2.	Buyers update their Responsibility evaluation goal.	6/15/13
3.	Buyers identify top suppliers they plan to engage this year, connect and coordinate with other WMT US and Sam's buyers who might have the same suppliers.	6/15/13
4.	Buyers jointly forward the Supplier Toolkit deck and letter of executive support to account teams to explain objectives. Request suppliers complete the Fertilizer Optimization plan template in toolkit. *Buyers may choose to hold a brief call with suppliers.* ***SO will host a webinar for participating suppliers on Thursday, June 27, 2013 at 11 am CST.***	6/15/13
5.	Suppliers due to submit plans to buyers. Executive communication via JBP, top-to-top, etc.	7/15/13
6.	Internal WMT/Sams Merchant Coalition reviews progress and what we expect to achieve this year.	8/1/13
7.	Convene Buyer-Supplier call to review plans and agree to milestones. **New plan and tracker due by 9/1/13**.	8/15/13
8.	Supplier Summit/Convening to feature supplier testimonials, on the ground impact stories from experts to show how these programs work.	9/12/13
9.	Suppliers submit plan and tracker update.	12/15/13
10.	Merchant Coalition in-person meeting: Winner announced, Supplier recognized, Summary of results report-out	1/15/14

Submit questions and suggestions to your buyer and/or the Walmart Sustainability Hub:
http://www.walmartsustainabilityhub.com/app/ghg_idea

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FERTILIZER OPTIMIZATION PLAN

Please work with your Walmart US and Sam's Club buying teams to draft and agree to a Fertilizer Optimization Plan – a living document that drives progress and continuous improvement.

This section includes:

1. *Plan Template*
2. *Example Plans*
3. *Guidance on definitions and scope.*

TEMPLATE: Plan

Walmart Supplier Toolkit - Fertilizer Optimization Sustainability Plan

Supplier Name: [supplier name, vendor #]

Team: [Account Lead] , [Buyer]

Category: [Category]

% of Category Sales: [percent]

Fertilizer Optimization Plan Objectives:

- Identify, prioritize and deliver opportunities to improve fertilizer optimization, input cost reduction and GHG reduction, with consistently measured Greenhouse Gas (GHG) reductions.
- Integrate preferences into conventional business processes and systems (e.g. contract-growing, bids, specifications, sourcing commitments, etc.).

Metrics and Goals:

Fertilizer Optimization Plan Finalized: [date]

Growth of Business: [Supplier growth vs. category growth]

Program Level: [Select Level 1-4]

[Crop]	FY2014		FY2016			FY2018		
	Total	Engaged	Total	Engaged	% Inc.	Total	Engaged	% Inc.
[County 1]	[acres]	[acres]						
[County 2]	[acres]	[acres]						
[County …]	[acres]	[acres]						

WMT Priority Impact:

Sustainability Index Scorecard

- On-farm efficiency and improvement KPIs could yield a 25% improvement potential

Other Goals

- 20MMT of GHG ; Small Farmers

Key Milestones:

Phase 1: Map & Benchmark

1. Identify and onboard supplier's internal team, including sales, sustainability, and sourcing. *[DUE DATE]*
2. Define grower **Points of Aggregation** (i.e. mills, elevators) and **Engagement Area(s)** through Crop Mapping Exercise and/or other approaches. *[DUE DATE]*

Phase 2: Scope

1. Define the size of the prize for all parties by estimating opportunities for fertilizer optimization potential and possible programs to engage in the **Engagement Area** through **Gap Analysis** or other methods. *[DUE DATE]*
2. Identify the **Programs, Agronomic Practices and Tools** (e.g. Field to Market Pilot, NextField, Adapt Network, etc.), external stakeholders, agronomic resources, and costs to optimize fertilizer use. *[DUE DATE]*
3. Buyer/Walmart Meeting to report findings, implications, ROI prioritization, and recommendations. Agree to path forward and goals for Year 1, 3 and 5. *[DUE DATE]*

Phase 3: Implement

1. Track and report progress with programs and suppliers. Quarterly status update and Top to Top meetings. *[DUE DATE]*
2. Integrate preferences into conventional **business processes** and systems (e.g. contract-growing, bids, specifications, sourcing commitments, etc.). *[DUE DATE]*

Bold terms defined in guidance section.

TEMPLATE: Deliverables

Walmart Supplier Toolkit - Fertilizer Optimization Sustainability Plan

Supplier Name: [supplier name, vendor #]

Team: [Account Lead] , [Buyer]

Category: [Category]

% of Category Sales: [percent]

[Describe what success looks like based on the Key Metrics in the plan.]

Phase	Year 1 Deliverables	Year 3 Deliverables	Year 5 Deliverables
Map & Benchmark			
Scope			
Implement			

TEMPLATE: Progress Tracker

Walmart Supplier Toolkit - Fertilizer Optimization Plan Tracker

Supplier Name: [Supplier Company] To be submitted to buyer: Due 7/15/13, 9/1/13, 1/1/14

	Milestone	Status	Comments
Map & Benchmark	1. Identify and onboard supplier's internal team, including sales, sustainability, and sourcing.		
	2. Define grower **Engagement Area** through Crop Mapping Exercise and/or other approaches.		
Scope	Define the size of the prize for all parties by estimating opportunities for fertilizer optimization potential and possible programs to engage in the **Engagement Area** through **Gap Analysis** or other methods.		
	Identify the **Programs, Agronomic Practices and Tools** (e.g. Field to Market Pilot, NextField, Adapt Network, etc.), external stakeholders, agronomic resources, and costs to optimize fertilizer use.		
	Buyer/Walmart Meeting to report findings, implications, ROI prioritization, and recommendations. Agree to path forward and goals for Year 1, 3 and 5.		
Implement	1. Track and report progress with programs and suppliers. Quarterly status updates, Top to Top meetings.		
	2. Integrate preferences into conventional **business processes** and systems (e.g. contract-growing, bids, specifications, sourcing commitments, etc.).		

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EXAMPLE: Plan

Walmart Supplier Toolkit - Fertilizer Optimization Sustainability Plan

Supplier Name: Kellogg Company [vendor #]

Team: Scott Salmon, Diane Holdorf, Tim Ziegler, Esther Gifford, Martin Brown

Category: Cereal and Baked Goods

% of Category Sales: [percent]

Fertilizer Optimization Plan Objectives:

- Identify, prioritize and deliver opportunities to improve fertilizer optimization, input cost reduction and GHG reduction, with consistently measured Greenhouse Gas (GHG) reductions.
- Integrate preferences into conventional business processes and systems (e.g. contract-growing, bids, specifications, sourcing commitments, etc.).

Metrics and Goals: Kellogg North American Corn

Fertilizer Optimization Plan Finalized: May 23, 2013

Growth of Business: [Supplier growth vs. category growth]

Program Level: Level 4: trained pro + soil health

Corn	FY2012		FY2014			FY2016		
	Total	Engaged	Total	Engaged	% Inc.	Total	Engaged	% Inc.
Crete, NE	43,000 ac/ 7,525,000 bu	40,000 ac/7,000,000 bu	43,000	40,000	90%+	43,000	40,000	90%+
Danville, IL	31,000 ac/ bu	0 ac / 0 bu	31,000	28,000	90%+	31,000	28,000	90%+
Atchison, KS	32,000 ac/ bu	0 ac / 0 bu	32000	29,000	90%+	32000	29,000	90%+

WMT Priority Impact:

Sustainability Index Scorecard

- On-farm efficiency and improvement KPIs could yield a 25% improvement potential
- Priority is fertilizer, however KPI's also include irrigation use, fuel use, etc.

Other Goals

- 20MMT of GHG
- Small Farmers

Key Milestones:

Phase 1: Map & Benchmark

1. Identify and onboard supplier's internal team, including sales, sustainability, and sourcing.
2. Define grower **Engagement Area** through Crop Mapping Exercise and/or other approaches.

Phase 2: Scope

1. Define the size of the prize by quantifying nitrogen used in the **Engagement Area** and its associated GHG emissions (using secondary data).
2. Identify and quantify the scope and scale of opportunities at the **Point of Aggregation** (i.e. mills, elevators) to improve nitrogen efficiency through **Gap Analysis**.
3. Identify the **Programs, Agronomic Practices and Tools** (e.g. Field to Market Pilot, NextField, Adapt Network, etc.), external stakeholders, agronomic resources, and costs to optimize fertilizer use.
4. Buyer/Walmart Meeting to report findings, implications, ROI prioritization, and recommendations. Agree to path forward.

Phase 3: Implement

1. Track and report progress with programs and suppliers. Quarterly status update and Top to Top meetings.
2. Integrate preferences into conventional **business processes** and systems (e.g. contract-growing, bids, specifications, sourcing commitments, etc.).

Bold terms defined in guidance section.

EXAMPLE: Deliverables

Walmart Supplier Toolkit - Fertilizer Optimization Sustainability Plan

Supplier Name: Kellogg Company [vendor #]

Team: Scott Salmon, Diane Holdorf, Tim Ziegler, Esther Gifford, Justin Williamson

Category: Cereal and Baked Goods

% of Category Sales: [percent]

Kellogg North America - Corn

Phase	Year 1 Deliverables	Year 3 Deliverables	Year 5 Deliverables
Map & Benchmark	All mapping completed. NE grower engagement and benchmark work completed. IL and KS grower engagement started.	IL and KS growers also fully engaged.	Further grower engagement in all 3 areas.
Scope	Assessed for NE with FieldPrint calculator agronomic expert support to identify and implement practices. Set specific goals for each location.	Data for IL and KS collected using FieldPrint calculator , assessed with external agronomic partners engaged, and some practices implemented. Benchmark performance to goals.	Continued progress with external programs, practices and tools to support grower practice changes.
Implement	Incorporate additional stakeholders and advisors. Reported to WM Merchant team. In process of embedding specific data and actions into supplier contract documentation.	Improvements documented and reported in NE, potentially in IL and KS also. Fully embedded in supplier contract documents.	Improvements documented and reported in all 3 grower engagement locations.

EXAMPLE: Progress Tracker

Walmart Supplier Toolkit - Fertilizer Optimization Plan Tracker

Supplier Name: Kellogg Company To be submitted by supplier: Due 7/15/13, 9/1/13, 1/1/14

	Milestone - For Kellogg North American Corn	Status	Comments
Map & Benchmark	1. Identify and onboard supplier's internal team, including sales, sustainability, and sourcing.	Complete	
	2. Define grower **Engagement Area** through Crop Mapping Exercise and/or other approaches.	Complete for : Crete, NE / Danville, IL / Atchison, KS	3 years of Crete input data. 2013 data gathering in KS & IL
Scope	1. Define the size of the prize by quantifying nitrogen used in the **Engagement Area** and its associated GHG emissions (using secondary data).	Complete for Crete, NE : In 2012 N used = 7,840,000 lbs.	Developing for Atchison, KS & Danville, IL
	2. Identify and quantify the scope and scale of opportunities at the **Point of Aggregation** (i.e. mills, elevators) to improve nitrogen efficiency through **Gap Analysis**.	Gap analysis is underway in Crete, NE This work will be initiated in KS & IL in 2013/14	Scope and scale of opportunity will be initiated in 2014
	3. Identify the **Programs Agronomic Practices and Tools** (e.g. Field to Market Pilot, NextField, Adapt Network, etc.), external stakeholders, agronomic resources, and costs to optimize fertilizer use.	No till farming & cover crops education / adoption utilizing Field Print Calculator data and UNL & NCRS agents	KS & IL to utilize Field Print Calculator for 2013 data. Stakeholders and partners will be identified in 2014
	4. Buyer/Walmart Meeting to report findings, implications, ROI prioritization, and recommendations. Agree to path forward.	To be scheduled	
Implement	1. Track and report progress with programs and suppliers. Quarterly status updates, Top to Top meetings.	To be scheduled	
	2. Integrate preferences into conventional **business processes** and systems (e.g. contract-growing, bids, specifications, sourcing commitments, etc.).	In process of formal documentation in corn supplier contract documents	

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GUIDANCE

Walmart Supplier Toolkit - Fertilizer Optimization Sustainability Plan

Supplier Name: [supplier name, vendor #]

Team: [Account Lead] , [Buyer]

Category: [Category]

% of Category Sales: [percent]

Suppliers may have multiple categories and buyers across WMT US and Sams.

Agree with buyer on the right metric for part of the business this effort represents and who is accountable.

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GUIDANCE

Fertilizer Optimization Plan Objectives:

- Identify, prioritize and deliver opportunities to improve fertilizer optimization, input cost reduction and GHG reduction, with consistently measured Greenhouse Gas (GHG) reductions.
- Integrate preferences into conventional business processes and systems (e.g. contract-growing, bids, specifications, sourcing commitments, etc.).

These are suggested.
Refine and calibrate as needed in agreement with buyer, but adhere to the spirit to these examples.

GUIDANCE

Metrics and Goals:

Fertilizer Optimization Plan Finalized: [date]

Growth of Business: [Supplier growth vs. category growth]

Improvement Program: [Select Level 1-4, Identify Program]

[Crop]	FY2014		FY2016		FY2018	
	Total	Engaged	Total	Engaged	Total	Engag
[County 1]	[acres]	[acres]				
[County 2]	[acres]	[acres]				
[County …]	[acres]	[acres]				

- Provide date when the plan was agreed to by the supplier and buyer.
- Identify what percent growth you as a supplier represent for the WMT/Sams business.
- We understand that ALL acres which feed into an aggregation point (mill or elevator) may be included in the plan. Therefore, identify total acres in the aggregation area and the number of acres engaged in / communicated with the sustainability fertilizer opportunity plan.
  - Bushels can be used if acres are not available.
- To simplify and standardize program identification, we have categorized programs into certain types. **See slide 21+ for level criteria.**
- Identify which crop or crops you are engaging in: corn, wheat or soy.
- Identify which county (preferable) or states are included. Additional pages for the detailed plans can be provided by crop or by state.

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GUIDANCE

List KPIs most important to you as a company.

It is important to recognize how this effort contributes to Walmart's sustainability commitments.

The Sustainability Index Scorecard is our primary measurement tool for progress and impetus for this work.

Further, we want to drive fertilizer optimization because of its contributions to our GHG reduction goals.

However, there are other KPIs that are important in a growing area, and that are on our Sustainability Scorecard which we also want to support.

WMT Priority Impact:

Sustainability Index Scorecard

- On-farm efficiency and improvement KPIs could yield a 25% improvement potential

Other Goals

- 20MMT of GHG ; Small Farmers

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TEMPLATE

Definitions of Bolded Terms:

- **Engagement Area**: Number of acres involved in the Fertilizer Optimization Sustainability Plan. May include only some of the farmers which sell to an identified mill or elevator (**Point of Aggregation**), which is why this number may be different than **Total Acres** (farmed by all growers selling to the mill or elevator).
- **Point of Aggregation / Mill Orbit**: The mill or elevator represents a way of defining a growing area within which you will have a Fertilizer Optimization Sustainability Plan. It is therefore used as a reference point.
- **Gap Analysis**: The process of comparing applied fertilizer data with predictive tools to define the opportunity to optimize fertilizer use on those acres.
- **Programs and Tools**: As we are not farmers and prefer to avoid prescribing particular practices. Instead we are focused on driving programs and tools that help farmers leverage practices to optimize inputs and improve yields. Participation in such a program is a proxy for impact. **See slides 21+ for program level criteria.**
- **Business Processes**: Overtime, we expect these conversations and communications to be integrated into traditional business transactions between suppliers. Where/when/how will vary depending on your relationships and processes.

Key Milestones:

Phase 1: Map & Benchmark

1. Identify and onboard supplier's internal team, including sales, sustainability, and sourcing. *[DUE DATE]*
2. Define grower **Points of Aggregation** (i.e. mills, elevators) and **Engagement Area(s)** through Crop Mapping Exercise and/or other approaches. *[DUE DATE]*

Phase 2: Scope

1. Define the size of the prize for all parties by estimating opportunities for fertilizer optimization potential and possible programs to engage in the **Engagement Area** through **Gap Analysis** or other methods. *[DUE DATE]*
2. Identify the **Programs, Agronomic Practices and Tools** (e.g. Field to Market Pilot, NextField, Adapt Network, etc.), external stakeholders, agronomic resources, and costs to optimize fertilizer use. *[DUE DATE]*
3. Buyer/Walmart Meeting to report findings, implications, ROI prioritization, and recommendations. Agree to path forward and goals for Year 1, 3 and 5. *[DUE DATE]*

Phase 3: Implement

1. Track and report progress with programs and suppliers. Quarterly status update and Top to Top meetings. *[DUE DATE]*

   Integrate preferences into conventional **business processes** and systems (e.g. contract-growing, bids, specifications, sourcing commitments, etc.). *[DUE DATE]*

Bold terms defined in guidance section.

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TOOLS AND RESOURCES

1. Crop Mapping Exercise
2. Improvement Program Criteria Levels
3. FAQs

Crop Mapping Exercise: Overview

- Given how commodity grains are sourced and delivered to market, it is neither practical nor necessary to trace our products back to the farm-level. However, you still need to prioritize how you will partner upstream.

- One potential pathway is a Crop Mapping Exercise that defines the aggregation points (e.g. mills or elevators) your supply chain relies on to bring you vital commodities.

- In December 2012, Walmart asked ~15 key food suppliers to help us understand where the grains in our products come from. We asked for three-year annual averages of corn, wheat, and soy by state. We provided banded response options. Corn example:

CORN (in raw, modified or derived formats)

As an annual average over the last three years, please indicate the US states and associated volume ranges from which you source commodity **corn** based ingredients/materials for your product/category/supply chain?

When considering the US state of origin, we are interested in the location of the mill from which you procure corn, not the field.

Please complete for at least the Top 5 states (by volume):

	None (N/A)	1 to 1,000 Tons	1,000 to 10,000 Tons	10,000 to 100,000 Tons	100,000 to 1 Million Tons	More than 1 Million Tons
Colorado	○	○	○	○	○	○
Illinois	○	○	○	○	○	○
Indiana	○	○	○	○	○	○
Iowa	○	○	○	○	○	○
Kansas	○	○	○	○	○	○
Kentucky	○	○	○	○	○	○
Michigan	○	○	○	○	○	○

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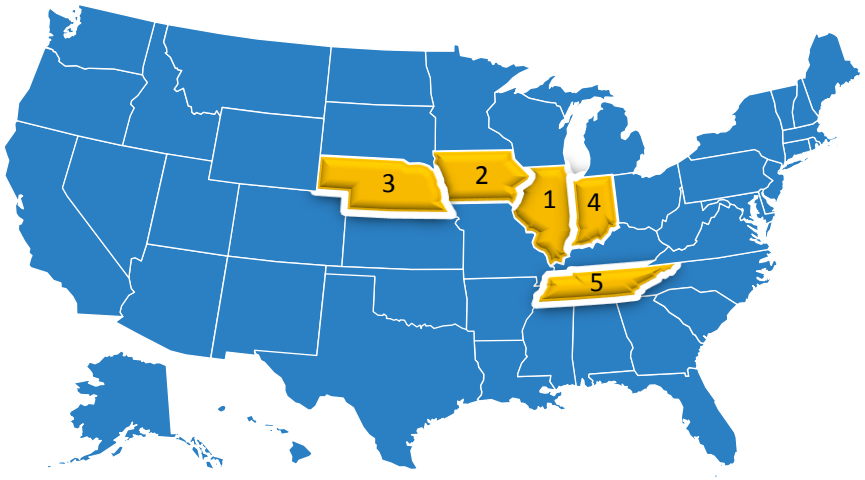
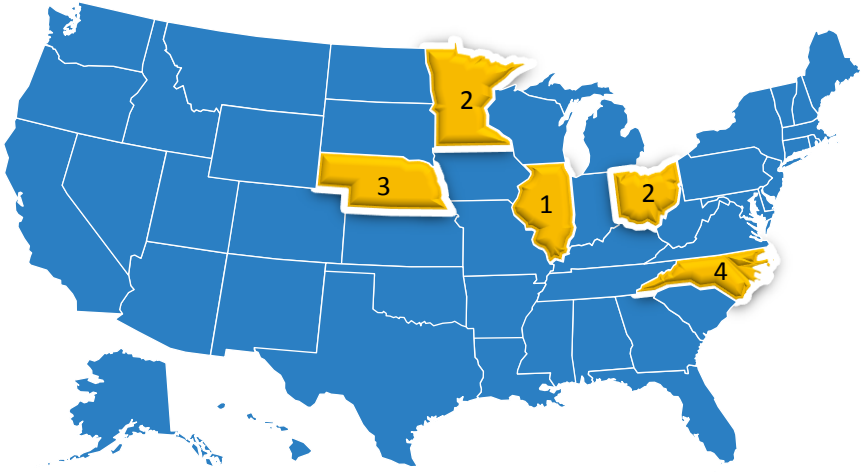
Crop Mapping Example Results: Priority states by commodity and in aggregate

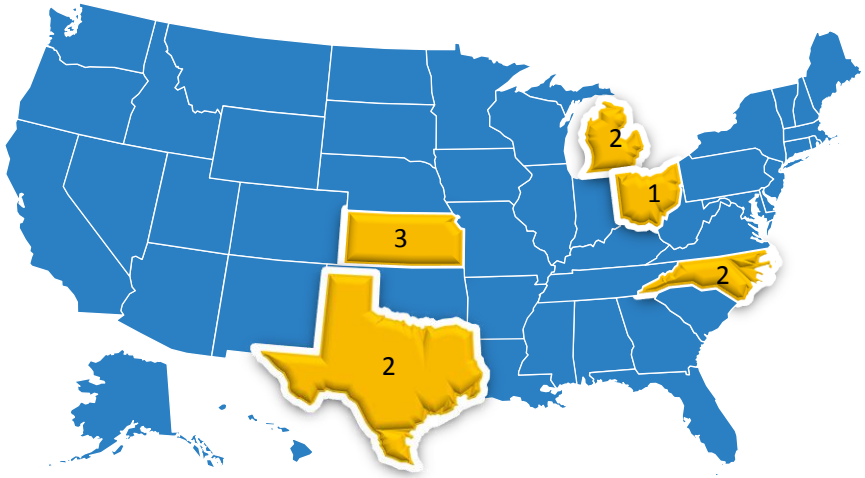
Corn States



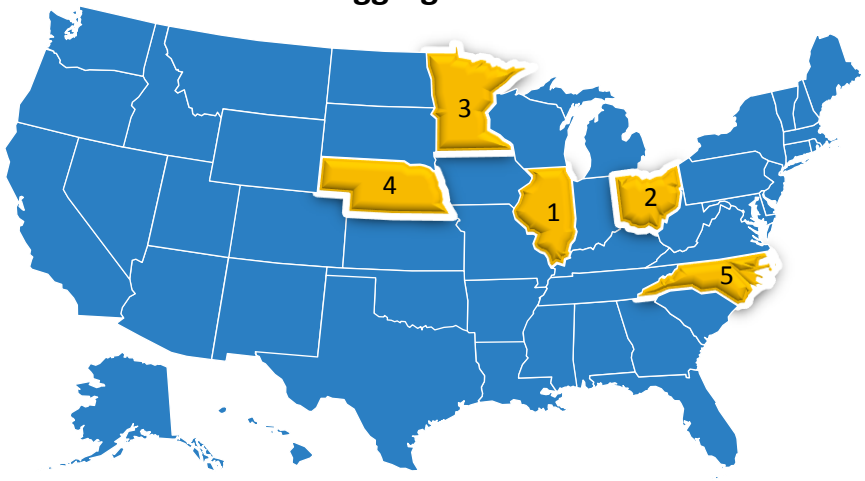
Soy States



Wheat States



Aggregate



Ranking based on volume of commodity sourced and number of suppliers sourcing from the particular state

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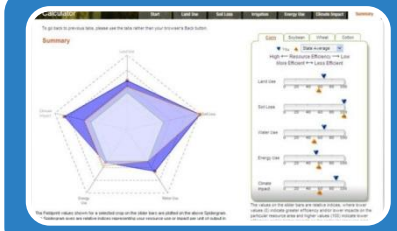
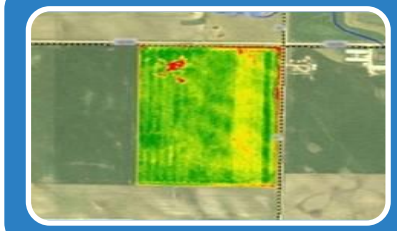
Levels of Fertilizer Optimization Programs



Level 1: Benchmarking & Plan
Benchmarking performance against local or national level and development a nutrient management plan

Level 2: Plan Evaluation
Basic evaluation and adaptation of nutrient management plan



Level 3: Network
Participation in group/network led by trained agronomic advisor or employ highly specialized professional

Level 4: Network + Soil Health
Participation in group/network led by trained agronomic advisor or employ highly specialized professional – AND – Soil health enhancements

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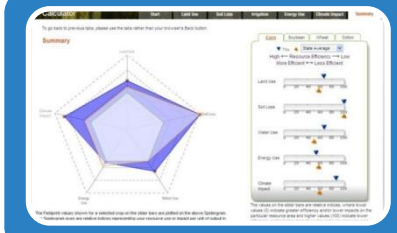
Examples of Programs, Tools, and Initiatives by Level

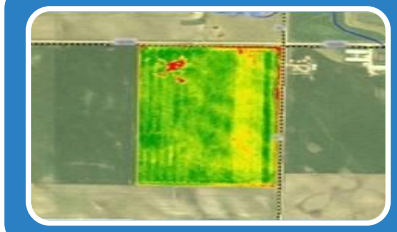


Level 1 - Nutrient management plan with benchmarking

Ex: Using Field to Market's Field Print Calculator to benchmark performance against other farmers, locally and at a state and national level

Level 2 - Basic evaluation and adaptation of nutrient management plan

Ex: Performing the Corn Stalk Nitrate Test (CSNT), also known as the "post mortem" of the previous year's crop, which can help farmers determine if excessive amounts or inadequate amounts of nitrogen were used, and then adjusting the nutrient management plan as needed



Level 3 – Highly trained professional/agronomist

Ex: Use of variable rate application technology, Cornell's Adapt-N tool or participation in an Adapt Network in order to fine-tune nutrient applications based on field-specific data

Level 4 – Highly trained professional/agronomist and soil health

Ex: Use of variable rate application technology, Cornell's Adapt-N tool or participation in an Adapt Network in order to fine-tune nutrient applications based on field-specific data as well as practices that help reduce soil erosion, like cover crops

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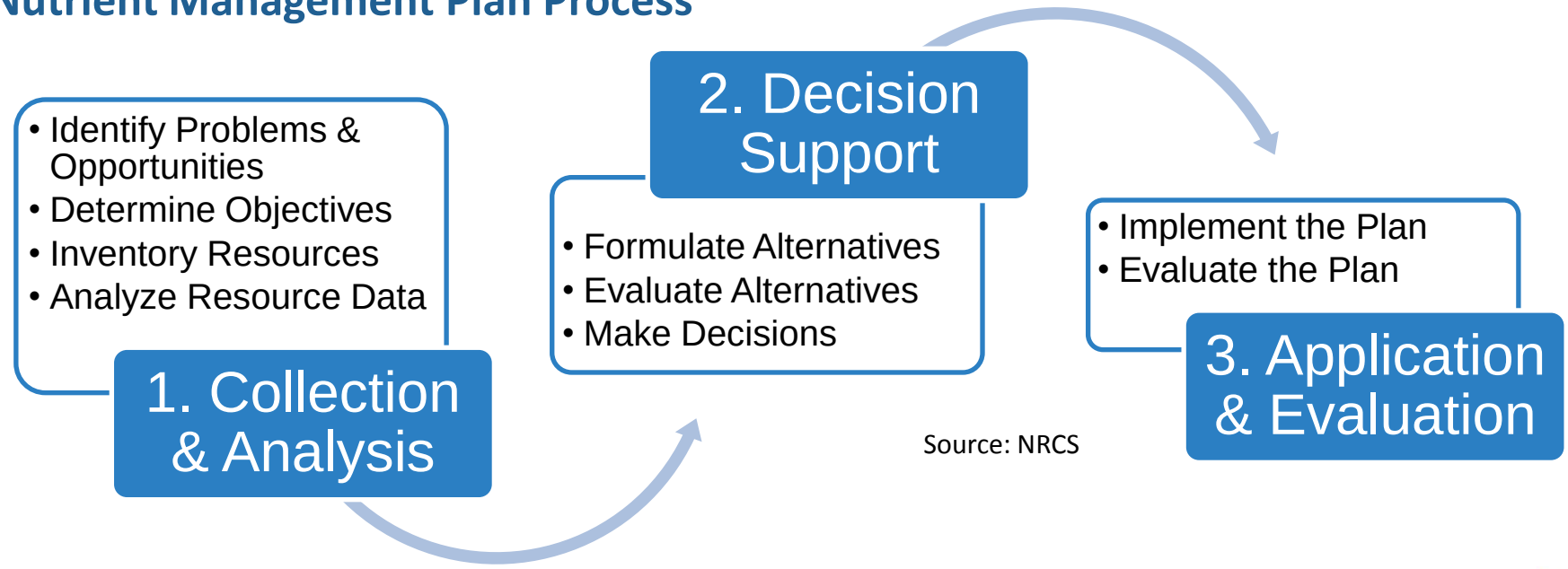
Level 1 Criteria:
Nutrient management plan and benchmarking

- Nutrient management plans provide farmers with the basic framework, which includes recordkeeping, sampling, and recommended rates for nutrient applications, as well as source, placement, form and timing.
- Farmers can get nutrient management plans from NRCS, their local conservation district, cooperative extension, or through a private crop consultant. NRCS, conservation districts, and state agricultural conservation programs often offer financial and technical assistance to farmers for development of nutrient management plans.

Nutrient Management Plan Process

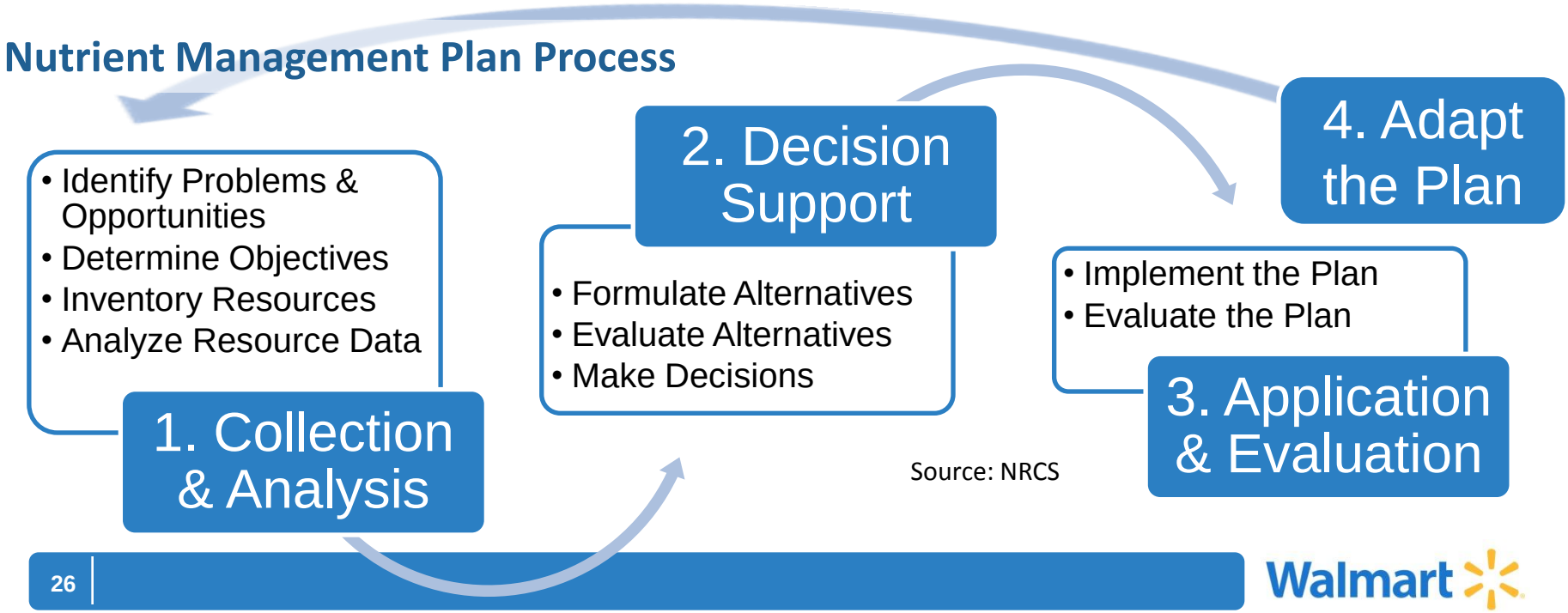


Source: NRCS

Level 2 Criteria:
Evaluation and adaptation of nutrient management plan

- Typically, nutrient management plans do not call for specific nitrogen sampling and are only revised every 3-5 years. These plans provide a good starting point, but do not include guidance for farmers to evaluate and then refine management to account for site specific conditions and variability.
- Nutrient management plans are most effective when they are used in conjunction with tools that can help farmers evaluate how well they are working, where there are opportunities to improve and then improved accordingly.
- Examples of useful tools include: leaf tissue test, chlorophyll meters, guided stalk sampling, crop sensors, pre-side dress soil nitrate test, corn stalk nitrate test, etc.

Nutrient Management Plan Process



Source: NRCS

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Level 3 Criteria:
Highly trained professional/agronomist

Farmers can get input from highly trained professionals/agronomists (i.e., focused on the 4Rs – getting the right fertilizer source at the right rate at the right time and in the right place) through a number of channels:

1. Participate in an on-going initiative with a network, peer group, cooperative, or other coordinated group involving trained agronomic advisors that use evaluation tools to assess and optimize fertilizer management.
2. Use on-line tool or software package to optimize fertilizer management.
3. Employ/utilize highly specialized, professional expertise for improving fertilizer efficiency that enhance or go beyond standard precision ag tools (i.e. professional agronomists).

Examples:

1. 4Rs via Initiative
   - On-Farm Network &
   - Adapt Network

OR

2. 4Rs via Tool
   - Adapt-N

OR

3. 4Rs via Expert
   - Professional Agronomist

Level 4 Criteria:
Highly trained professional/agronomist and soil health

In addition to farmers optimizing nutrient use efficiency through improved management practices via highly trained professionals/agronomists (i.e., focused on the 4Rs – getting the right fertilizer source at the right rate at the right time and in the right place), farmers can also use practices that improve the ability of the soil to produce effectively and sustainably and reduce soil loss through erosion

Examples:

1. 4Rs via Initiative
   - On-Farm Network &
   - Adapt Network

OR

2. 4Rs via Tool
   - Adapt-N

OR

3. 4Rs via Expert
   - Professional Agronomist

AND

Soil Health Improvements
Cover Crops and No-Till

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Tools, Programs, and Agencies

State	Tools, Programs, and Agencies (alphabetical)	Levels	Website/Contact
National	Adapt-N	3, 4	adapt-n.cals.cornell.edu
	Conservis	3, 4	conserviscorp.com
	FarmersEdge	3, 4	www.farmersedge.ca (Chacko Jacob)
Illinois	Adapt Network	3, 4	adaptnetwork.org
	Keep It for the Crop (KIC)	3, 4	www.kic2025.org
	Natural Resources Conservation Service Illinois	1, 2, 3, 4	www.il.nrcs.usda.gov (Paula Hingson or Brett Roberts)
	University of Illinois Extension	1, 2, 3, 4	web.extension.illinois.edu/state/index.html (N. Dennis Bowman)
Indiana	Adapt Network	3, 4	adaptnetwork.org
	Conservation Cropping System Initiative	3, 4	www.in.gov/isda/ccsi
	Indiana Natural Resources Conservation Service	1, 2, 3, 4	www.in.nrcs.usda.gov (Shannon Zezula)
	Indiana State Department of Agriculture	1, 2, 3, 4	www.in.gov/isda (Jordan Seger)
	On Farm Network	3, 4	www.in.gov/isda/ofn
	Purdue Extension	1, 2, 3, 4	www3.ag.purdue.edu/extension (Jim Camberato or Bob Nielsen)

Note: this list is not exhaustive, but is meant to provide a starting place for getting more information

Tools, Programs, and Agencies (cont.)

State	Tools, Programs, and Agencies (alphabetical)	Levels	Website/Contact
Iowa	Adapt Network	3, 4	adaptnetwork.org
	Iowa Department of Agriculture	1, 2, 3, 4	www.iowaagriculture.gov (Dean Lemke or James Gillespie)
	Iowa State University Extension and Outreach	1, 2, 3, 4	www.extension.iastate.edu/ (John Sawyer)
	Natural Resources Conservation Service Iowa	1, 2, 3, 4	www.nrcs.usda.gov/wps/portal/nrcs/site/ia (Larry Beeler or Marty Adkins)
	On Farm Network	3, 4	www.isafarmnet.com
Nebraska	Nebraska Department of Agriculture	1, 2, 3, 4	www.nda.nebraska.gov
	Nebraska Natural Resources Conservation Service	1, 2, 3, 4	www.ne.nrcs.usda.gov (Craig Derickson or Brad Soncksen)
	University of Nebraska – Lincoln Extension	1, 2, 3, 4	www.extension.unl.edu (Richard B. Ferguson)
Tennessee	Tennessee Department of Agriculture	1, 2, 3, 4	www.tn.gov/agriculture
	Natural Resources Conservation Service Tennessee	1, 2, 3, 4	www.nrcs.usda.gov/wps/portal/nrcs/site/tn
	University of Tennessee Extension	1, 2, 3, 4	utextension.tennessee.edu

Note: this list is not exhaustive, but is meant to provide a starting place for getting more information

FAQs – 1 out of 3

Q: Why is Walmart talking about fertilizer optimization?

A: Walmart is interested in fertilizer optimization because the entire value chain needs to produce more with less to rise to the challenge of feeding 9B people.

- Walmart depends on the American farmer to efficiently produce the key ingredients in many of our products. Walmart wants to do our part to help ensure this productivity continues.

- Food and agriculture are a crucial part of our business and we need to take steps now to ensure a safe, affordable and sustainable supply chain for our customers' future. Fertilizer is a key and costly element of these supply chains.

- Walmart recognizes that growing world population and climate change have the potential to affect food supply, place increasing pressure on our natural systems and increase inflationary pressure.

- Walmart represents approximately a third of the US grocery industry, roughly half of our US sales come from food, and approximately 90% of the impact Walmart has on the environment takes place in our supply chain.
  - On-farm productivity and efficiency could drive a 25% improvement on sustainability scorecards in many categories.
  - Fertilizer optimization directly supports Walmart's global commitment to eliminate 20MMT of greenhouse gas from the supply chain.

- American agriculture is sophisticated, advanced, and based on a long heritage of land stewardship. For generations, farmers have of innovated and continuously improved their craft and their business. We are working to support the next step in this evolution and to rapidly deploy fertilizer optimization, which is currently only 50% efficient.
  - Caveats: Walmart will not tell farmers how to run their business. We will only advocate for net-benefit activities.

FAQs – 2 out of 3

Q: What does Walmart hope to accomplish?

A: Walmart's objectives are to align our food suppliers on the importance of fertilizer optimization in the way food is produced.

- Our suppliers need to signal unified interest, support, and demand for existing tools and information that can help producers continuously improve and optimize their nitrogen use, their yield, and their profitability.
  - Walmart thinks that transparency is important, but has concerns that, when dealing with commodity grains, traceability from the shelf to the farm imposes burdens and inefficiencies.
  - The last thing Walmart wants to do is add costs to the system. For this reason, Walmart would like to explore alternatives to traceability at the farm level to both drive and measure sustainability of commodity crops.

- We expect our key supplier partners to engage their procurement and sustainability teams to develop plans that drive growth of these kinds of activities

- Our partners are identifying networks and programs that promote continuous improvement and track progress in aggregate. We expect our suppliers to recognize and support these types of programs.

FAQs – 3 out of 3

Q: What are the benefits?

A: This approach drives efficiency, profitability, consistent supply, and sustainability.

- Efficiency: On average, only ~50% of fertilizer is absorbed by corn – that means there is 50% of waste for the single largest part of corn COGs.
- Profitability: Optimizing fertilizer will reduce farmer costs, improve or maintain yield, and better manage risk.
- Sustainability: Improve water quality and reduce greenhouse gas emissions.

Q: What's working to optimize fertilizer now?

A: The types of programs Walmart partners have identified use better data to drive these results. Here are some examples:

- The On-Farm Network (http://www.in.gov/isda/ofn) in Iowa and Indiana provides farmers with field-specific fertilizer information, allowing them to better understand this new information, and enables them to act upon that information. In one case study, Indiana farmers saved between 40-50 pounds of fertilizer per acre on their corn, with cost savings totaling about $20-$25 an acre.
- Adapt-N, a web-based tool in beta developed by Cornell University, helps farmers better manage weather risk and was Best New Product of the Year 2012 by AgProfessional magazine. On average, farmers in Iowa, increased grower profits by $25/acre, while reducing fertilizer application by 45 lbs/acre.
- Field to Market is an industry coalition developing pilots of farmers who use data to compare their costs and utilization rates to local, state, and national peers anonymously to reveal huge cost saving opportunities and debunk myths. Many of our suppliers are lead members in this organization.