



**The Africa Program
of the
International Plant Nutrition Institute**



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IFA AFRICA FORUM
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Outline

- Overview of IPNI
 - IPNI Global Programs
 - 4 R Nutrient Stewardship
- IPNI sub Saharan Africa Program
 - Focus sites
 - Fertilizer use information synthesis
 - Nutrient management research activities
 - Nutrient management knowledge products
 - The *Nutrient Expert* decision support

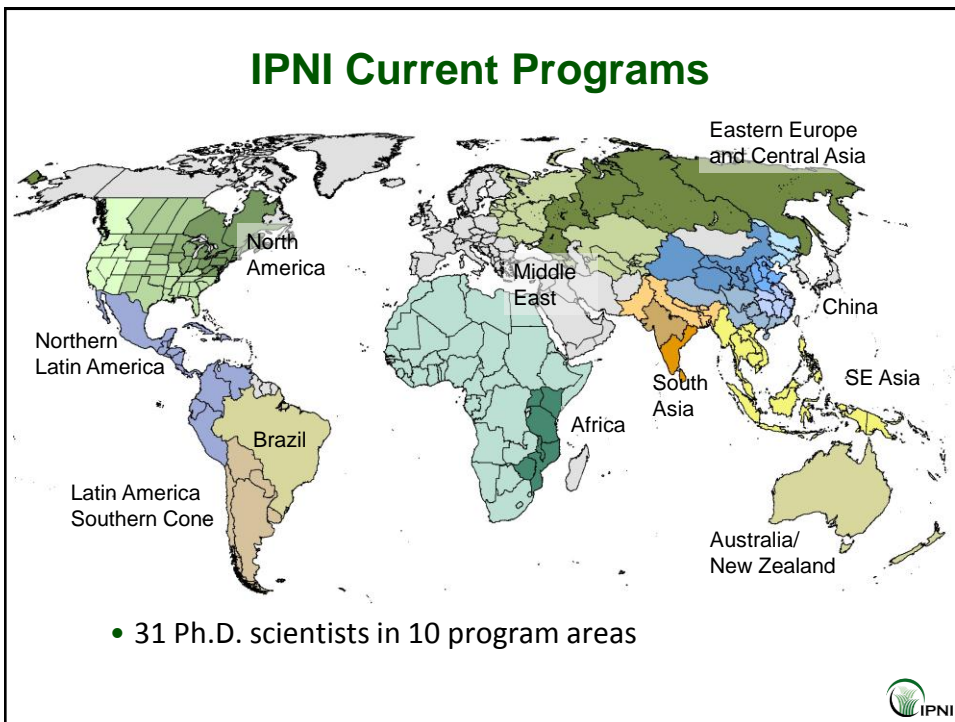
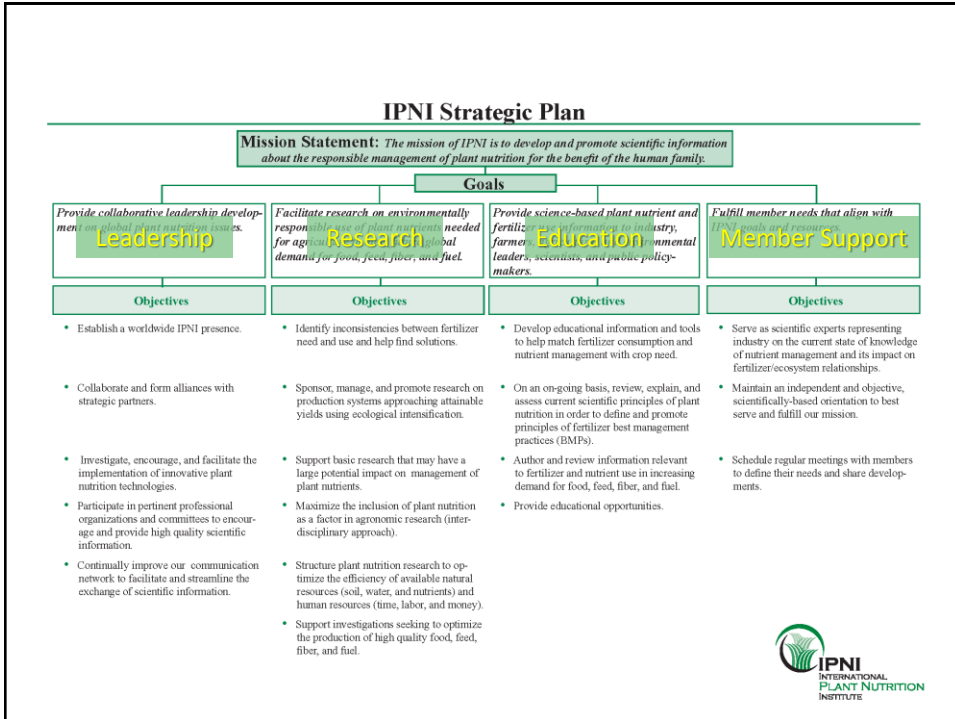


IPNI Overview

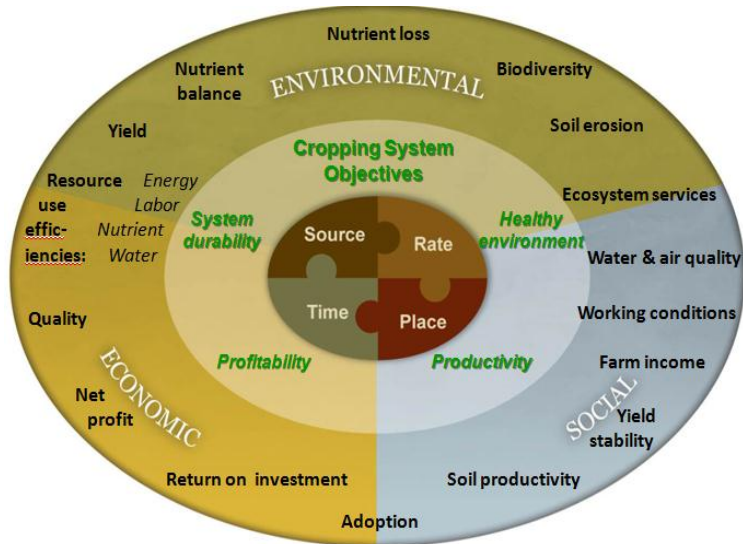
Better Crops, Better Environment ... through Science

IPNI is supported by leading fertilizer manufacturers and industry associations

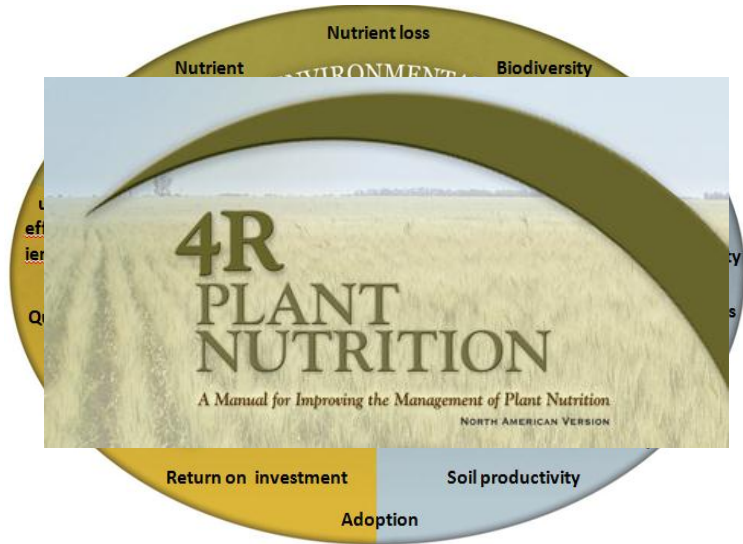
 Agrium Inc.	 Arab Potash Company	 Belarusian Potash Company	 CF Industries Holdings, Inc.	 ANDA - Associação Nacional para Difusão de Adubos	 Arab Fertilizer Association (AFA)
 Compass Minerals Specialty Fertilizers	 Incitec Pivot	 International Raw Materials LTD.	 Intrepid Potash, Inc.	 The Fertilizer Institute	 International Fertilizer Industry Association (IFA)
 K+S KALI GmbH	 The Mosaic Company	 OCP S.A.	 PotashCorp	 Canadian Fertilizer Institute (CFI)	 The Fertiliser Association of India
 Simplot	 Sinofert Holdings	 SQM	 Uralkali	 International Potash Institute (IPI)	



4R Nutrient stewardship framework



4R Nutrient stewardship framework





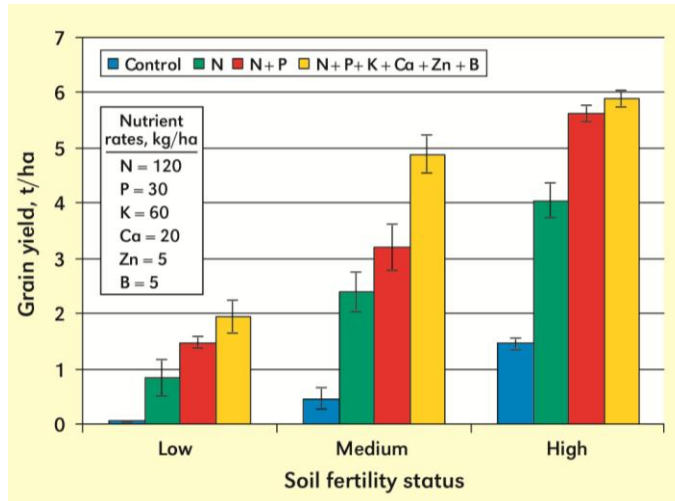
IPNI Africa Program

Background

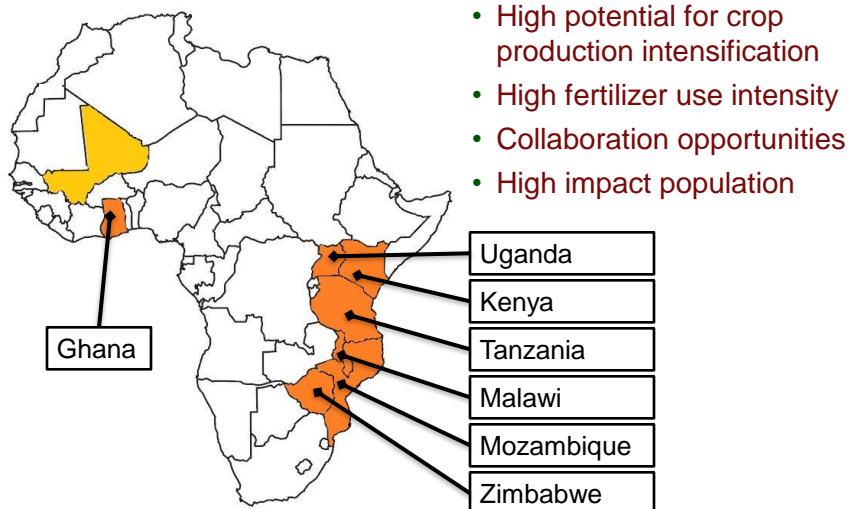
- Program activities contributing to sustainable intensification of agriculture in Sub Saharan Africa.
- Addressing some of the key challenges in nutrient management
 - ✓ Inappropriate fertilizer recommendations.
 - ✓ Poor consolidation of nutrient management research information.
 - ✓ Incoherent methods used to derive nutrient management recommendations.
 - ✓ Lack of good material on fertilizer 4Rs for extension.
 - ✓ Large gap between research and extension systems.
 - ✓ Availability of nutrient management decision support tools limited



Variability in soil fertility fertilizer response a major issue in SSA



Program priority sites



Fertilizer use information synthesis

Key activities

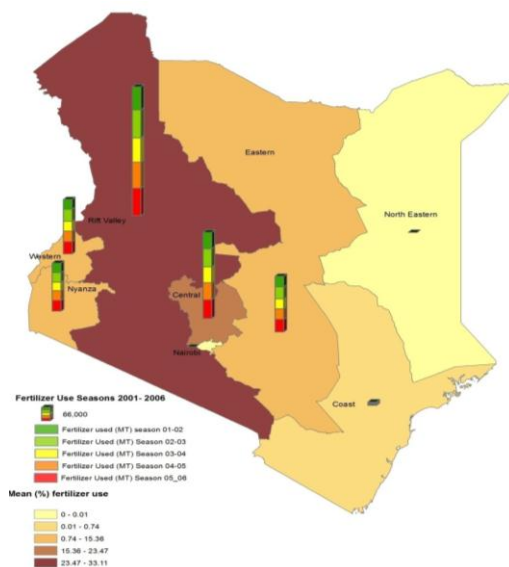
- Collection and synthesis of crop-specific production and nutrient use information disaggregated by regions within countries.
- Review and synthesis of scientific information on soil nutrient deficiencies and fertilizer 4Rs research results.
- Spatial analysis to show sites with best opportunities for crop production intensification.

Outputs

- Knowledge products (maps, reports, scientific publications) showing distribution of nutrient deficiencies, yield gaps, and economic analysis of intensification options.



Fertilizer use information synthesis



Fertilizer Use in Kenya highly variable for various agroecological zones and crops



Nutrient management research activities

Key activities

- Develop and validate standard approaches for developing site-specific nutrient management recommendations.
- Maize and legume crop agronomic research to assess response to N, P, K and secondary and micronutrients.

Output:

- Nutrient requirements and 4R framework for maize and soyabean in pilot sites developed.



Nutrient management research activities

Key activities

- Develop and validate standard approaches for developing site-specific nutrient management recommendations.
- Maize and grain legume crop agronomic research



- Multi-location experiments to assess attainable yields and nutrient-induced yield gaps and response to N, P, K and secondary and micronutrients.



Nutrient management research activities

Key activities

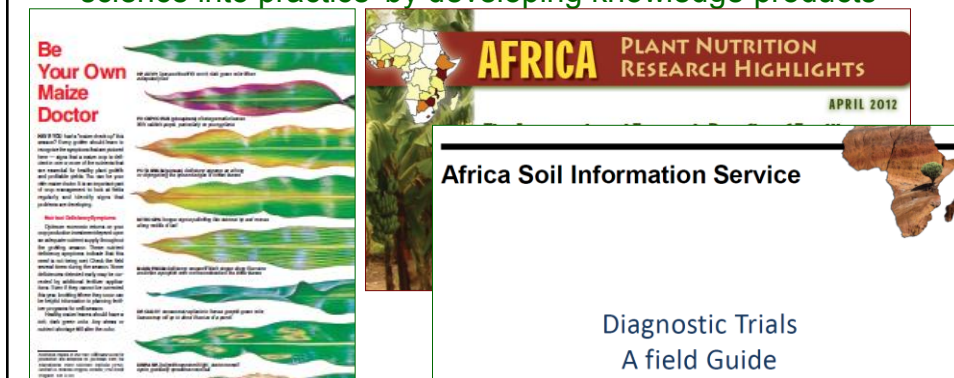
- Assessment and documentation of the status of oil palm production constraints, nutrient management practices and yield gaps.
- Fertilizer best management research to show potential for improving productivity and environmental and economic



Nutrient management knowledge products

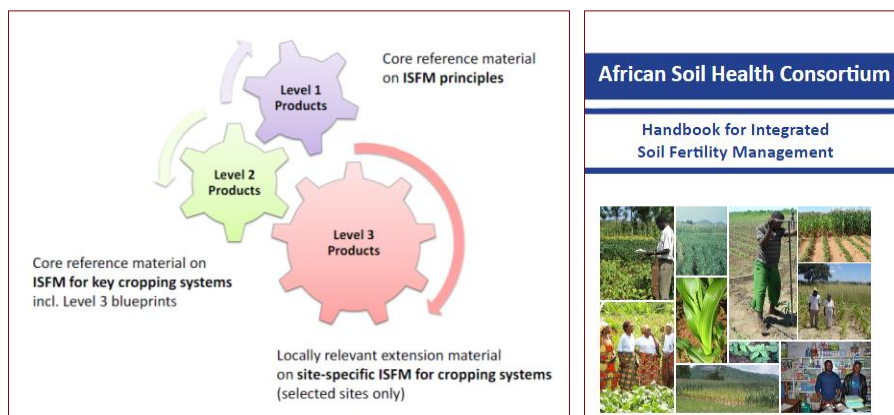
Key activities

- Develop 4R knowledge products for various stakeholders, including researchers, extension systems and farmers.
- Collaborate with researchers in the region to 'translate science into practice' by developing knowledge products



Nutrient management knowledge products

Supporting the Africa Soil Health Consortium



<http://www.cabi.org/ashc/>



The Nutrient Expert decision support

- Nutrient Expert is a DST based on the principles of site-specific nutrient management.
- Used in China, India, South-East Asia and Africa IPNI programs
- Developed to help local experts (researchers, extension agents) formulate site-specific fertilizer guidelines.
- A tool that helps in the rapid and robust implementation of SSNM in the field.
- An important learning tool to build capacity in nutrient management 4Rs.
- Combines scientific and local knowledge in a simple and practical approach



The Nutrient Expert decision support

Settings About Help Exit

Nutrient Expert for Hybrid Maize

Africa – Beta Version (December 2011)

First time user? Working in a new location? Make sure to have the 'Settings' right!

Nutrient Expert for Hybrid Maize helps you to:

- develop an optimal planting density for your location
- evaluate current nutrient management practices
- determine a meaningful yield goal based on attainable yield
- estimate fertilizer NPK rates required for the selected yield goal
- translate fertilizer NPK rates into fertilizer sources
- develop an application strategy for fertilizers (right rate, right source, right location, right time), and
- compare the expected or actual benefit of current and improved practices.

To start, click a button

Current
NM
Practice

➔

Planting
Density

➔

SSNM
Rates

➔

Sources &
Splitting

➔

Profit
Analysis



The Nutrient Expert decision support

Home Settings Help

Nutrient Expert for Hybrid Maize

Settings

Site Profile | Inorganic Fertilizers | Organic Fertilizers

Nutrient content and price of inorganic fert

Fertilizer sources	N	P2O5	K2O	MgO	CaO
16-20-0	16	20	-	-	-
16-20-9	16	20	-	-	-
17-0-17	17	-	17	-	-
17-2-17	17	2	17	-	-
18-46-0	18	46	-	-	-
20-10-0	20	10	-	-	-
20-20-15	20	20	15	-	-
21-0-0	21	-	-	-	-
DAP	18	46	-	-	-
KCl	-	-	60	-	-
NCP	-	-	60	-	-
Solophos	-	18	-	-	-
SSP	-	16	-	-	-
Urea	46	-	-	-	-

Home Settings Help

Nutrient Expert for Hybrid Maize

Current NM Practice | Planting Density | SSNM Rates | Sources and Splitting | Profit Analysis

Analyze farmer's current planting density:

- What is the distance between rows? cm
- What is the distance between plants in a row? cm
- How many plants per hill? one two

The current plant density: plants/ha.

Develop an improved planting density:

- What is your preference for row spacing structure? single row spacing double row spacing
- What is the best distance between rows? cm

60/70 cm 40/70 cm
 50/70 cm 30/70 cm

Nutrient Expert for Hybrid Maize

Current NM Practice | Planting Density | SSNM Rates | Sources and Splitting | Profit Analysis

Name and/or location: Field size: t/ha

Fertilizer N, P, and K requirements are based on yield goal (i.e. attainable yield) and expected

- What is the attainable yield for your location? t/ha
- What do you do with maize residues after harvest?
 - Remove all the above ground residues from the field
 - Retain stover in the field
 - Retain stover in the field and incorporate
 - Compost stover for incor
- Will you apply organic fertilizers (e.g. manure)? Yes No
- Determine residual benefit from your previous crop? Yes No
- Do you have results from omission plot trials conducted in a similar field in your municipal
 - N response: t/ha
 - P response: t/ha
 - K respon
- Will you apply Bo-N? Yes No

Nutrient Expert for Hybrid Maize

Current NM Practice | Planting Density | SSNM Rates | Sources and Splitting | Profit Analysis

Farmer's current practice | Recommended practice

Seed rate: kg/ha kg/ha (1 plant/hill)

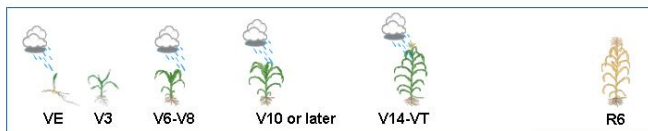
Cost of seeds: MWK/kg MWK/kg

Farm gate price of corn: MWK/kg

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Nutrient Expert for Hybrid Maize

Name and/or location: Field size: ha
 Current yield: ton (FW) t/ha (15.5% MC) Growing environment:
 Recommended alternative practice for hybrid maize
 Yield goal: ton (FW) t/ha (15.5% MC)
 Planting density: plants/ha Distance between rows: cm Distance between plants: cm



Growth stage	Days after planting	Soil moisture	Fertilizer sources	Weight of full bag (kg)	Amount (bags)
Basal	0	sufficient	18-46-0	50	1.5
			Urea	50	1
			KCl	50	2
V6	25	sufficient	Urea	50	2
V10	35	sufficient	Urea	50	2

Other sources of nutrients:
 Crop residue (rice):
 Organic fertilizer: t

Fertilizer rates are adjusted to field size



Name and/or location: Field size: ha

Current yield: t/ha (FW) t/ha (15.5% MC)

Growing environment:

Recommended alternative practice for hybrid maize

Yield goal: t/ha (FW) t/ha (15.5% MC)

Planting density: plants/ha

Distance between rows: cm Distance between plants: cm

Plan A (Sufficient moisture)



Growth stage	Days after planting	Soil moisture	Fertilizer sources	Weight of full bag (kg)	Amount (bags)
Basal	0	sufficient	14-14-14	50	4.5
V6	25	sufficient	Urea	50	2
V10	35	sufficient	Urea	50	2.5

Other sources of nutrients:

Crop residue:
 Organic fertilizer: t

Fertilizer rates are adjusted to field size



Name and/or location: Field size: ha

Current yield: cavan (FW) t/ha (15.5% MC)

Growing environment:


Recommended alternative practice for hybrid maize

Yield goal: cavan (FW) t/ha (15.5% MC)

Planting density: plants/ha

Distance between rows: cm Distance between plants: cm

Plan B (delayed rainfall at V6)




Growth stage	Days after planting	Soil moisture	Fertilizer sources	Weight of full bag (kg)	Amount (bags)
Basal	0	sufficient	14-14-14	50	4.5
V6	25	insufficient	Urea	50	0
V8-V10	30-35	sufficient	Urea	50	3

Other sources of nutrients: Fertilizer rates are adjusted to field size

Crop residue:

Organic fertilizer: t



Applying science to contribute to the realization of the green revolution in Africa



Thank you

Visit www.ipni.net for more information and access to nutrient management resources

