Constraints on FISP as a Poverty Reduction Strategy

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FISP's Objective and Constraints

- Objective: Poverty reduction
  - Rural poverty rates remain at nearly 80% in 2010 (roughly the same as in 2000)

- Constraints:
  - Targeting the less poor
  - Leakage of benefits
  - Inappropriate technology

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Targeting

- "Viable" farmers (>0.5 ha)
  - Rules out 15-20% of the poorest

- Cost of FISP to the farmer
  - Co-op Membership = K 50,000
  - Co-op Share = K 200,000
  - FISP packet = K 280,000
  - K 530,000 is more than 20% of annual income for 60% HH
  - Roughly a 50% subsidy

Targeting

Distribution of Smallholder Farm Households and FISP Fertilizer (2011)

Farm size (ha)	Percent of households	Percent of FISP kgs distributed
Less than 1	31.6	9.8
1 - 2	31.7	25.9
2 - 5	30.0	43.9
5 - 10	5.6	16.2
More than 10	1.1	4.2

Source: Crop Forecast Survey, 2011. "Farm size" is total area cultivated and fallow.

- 64% of FISP kgs went to the top 37% of farms

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Leakage

Planting year	Farmer claims		FSP/FISP distribution
	----------Metric Tons----------		
2002	31,722		48,000
2003	33,372		60,000
2004	16,792	33%	50,000
2005	23,595		50,000
2006	58,404		84,000
2007	43,596		50,000
2008	55,114		80,000
2009	69,103		106,000
2010	116,116		179,000
2002 - 10	447,814	63%	707,000

Source: Mason, 2011

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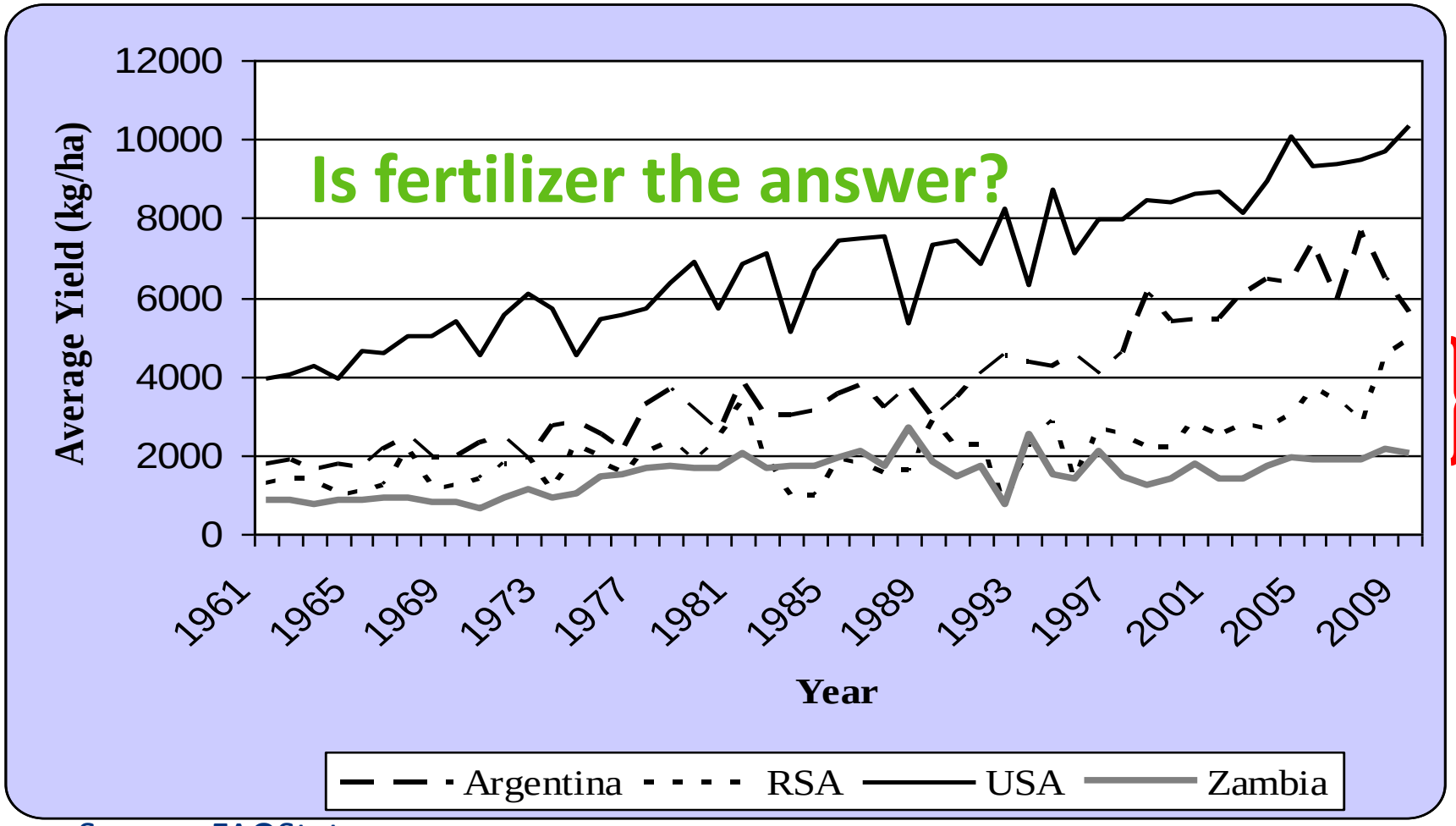
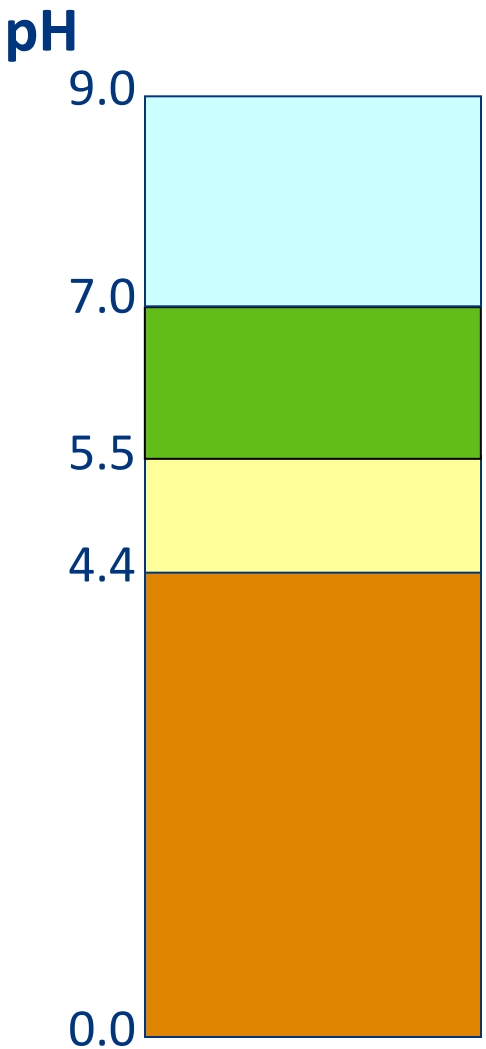
Appropriate Technology?



Source: FAOStat

Maize, Phosphorus and pH



Tricalcium Phosphates (unavailable)

Mono & Dicalcium Phosphates (max available)

Iron and Aluminum Phosphates (unavailable)

Inhibited ability for maize to consume nutrients

(Aluminum toxicity)

Source: Griffiths (2010); ZARI (2002)

Basal Productivity

Maize yield response to basal fertilizer over soil acidity ranges

Soil pH	3.1 - 4.3	4.4 - 5.4	5.5 - 7.1
Average partial effect of basal fertilizer application (kg/kg)	2.140** (0.01)	3.735*** (0.00)	7.552*** (0.00)
% of sample	51%	47%	2%

, * denotes significance at the 5% and 1% level respectively, delta method p-vlaues in parentheses

Effects of pH on yield response are as expected … unfortunately


From Larson and Oldham,
Mississippi State University Extension Service, 2008.
4.3
5.3

Policy Implications

- Target the poor more effectively
  - Program Against Malnutrition
  - Food Security Packs
- Prevent leakages
  - District-level monitoring using CFS data
  - Targeting will also help
- Address soil acidity

What can be done?

- Diversify subsidies beyond fertilizer
  - Lime
  - “Phosphorus enhancers”
  - Application method (banding)
  - Develop acid tolerant seed varieties

- Diversify strategy beyond subsidies
  - Research
  - Extension ⟶ Very Affordable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Thank You!

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Fertilizer Productivity on Small Farms

Fertilizer Yield Response Rates and Yield Differences by farm size

Farm Size (ha)	Yield response to fertilizer application (kgs maize per kg of fertilizer)	Difference if yield for fertilized vs. unfertilized fields (kg/ha)
Less than 1	3.73	924
1 - 2	3.48	710
2 - 5	3.52	751
5 - 10	3.68	812
More than 10	3.46	786

Source: CSO/FSRP Supplemental Survey data 2004, 2008 and Author's estimation

- Highest response rate
- Biggest difference in yields
- Net buyers of maize

Top Dress Productivity

Yield response to top dressing fertilizer by tillage and soil types

	Tillage method	
	Plowing	Other tillage methods
Soil type	------Average partial effect of top dressing (kg/kg)-----	
Sandy soils	2.625**	3.285***
	(0.02)	(0.00)
Other soil types	4.197***	4.978***
	(0.00)	(0.00)

- 50% neither plow nor plant on sand
- 12% plow on sandy soil
- 13% other tillage on sand
- 25% plow on other soils

Fertilizer Profitability

Cumulative distribution of average product of fertilizer use (maize kg/kg)