



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



INNOVATION LAB FOR  
**FOOD SECURITY  
POLICY**

# Fraudulent pesticides in West Africa: quality comparisons and policy implications

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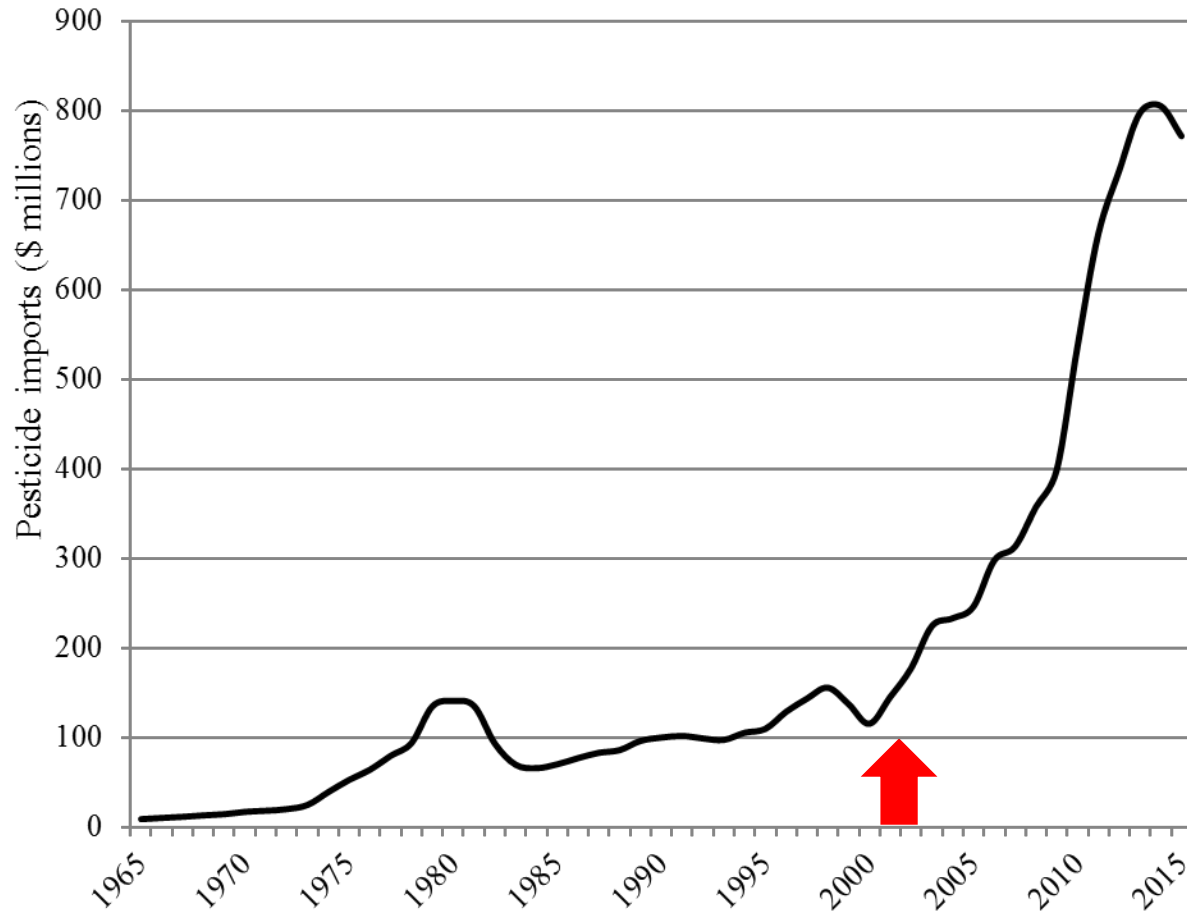


# Outline

1. Growing markets
2. Fraudulent products
3. Key risks
4. Action agenda

# 1. Growing markets

Figure 1. Pesticide import trends in West Africa



Source : FAOSTAT (2018)

# Mostly herbicides

Table 1. Pesticide imports into West Africa, 2015\*

Pesticide products	Imports	
	\$ millions	percent
Herbicides	552	62%
Insecticides	229	26%
Others**	104	12%
Total	885	100%

\* average, 2014 to 2016

\*\* fungicides, growth regulators, rodenticides, nematicides

Source: COMTRADE (2017), FAOSTAT (2017).

# Consequences of rapid market growth

- New traders
- Proliferating brands
- Fraudulent products

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Table 2. Trends in the number of registered pesticide importers, traders and applicators

	2000	2016	annual growth rate
Côte d'Ivoire			
importers	12	67	11%
retailers	113	779	13%
applicators	44	396	15%
Guinea			
importers	2	21	16%

Sources: Traore and Haggblade (2017a, 2017b).

# Consequences of rapid market growth

- **New traders**
- Proliferating brands
- Fraudulent



# Consequences of rapid market growth

- New traders
- **Proliferating brands**
- Fraudulent products

## Roundup and imitations





# Consequences of rapid market growth

- New traders
- **Proliferating brands**
- Fraudulent products

## Red Berets



# Consequences of rapid market growth

- New traders
- Proliferating brands
- **Fraudulent products**



# Consequences of rapid market growth

- New traders
- Proliferating brands
- Fraudulent products
- **Monitoring capacity can't keep pace**
- **Quality problems unmonitored**

## 2. Fraudulent products

- Market share hard to measure
- Highly variable enforcement
- Rough estimates: 8 West African countries
  - Unregistered: 27%
  - Counterfeits: 7%
  - Total fraudulent pesticides: 34%Source: MirPlus (2012)
- Mali fraudulent herbicides: 25% to 45%  
Source: Haggblade et al. (2018, 2019)

# Quality testing

## Study design:

- Select most widely sold pesticide: **glyphosate**
- Select location
  - High share of fraudulent products
  - Receptive regulators
  - **Mali**

# Sample selection

- Select 5 major agricultural markets
- List all pesticide retailers
- 50 retailers, randomly selected
- 2 samples purchased from each
  - top quality
  - cheapest
- 100 samples total



# Laboratory precision

Table 4. Laboratory precision\*

Differences between blind duplicates	Lab 1	Lab2	Lab 3
< 5%	3	6	3
6-10%	4	3	0
11-19%	1	1	1
over 20%	2	0	6
total	10	10	10

\* Differences between dosage estimates in 10 pairs of blind duplicate submissions.

Source: Haggblade et al. (2019)

# Fraudulent product quality

Table 5. Dosages of fraudulent and registered products

Registration status	Laboratory dosage / stated dosage			
	average	distribution		
		<75%	75-89%	90-110%
Fraudulent*	0.82	35	35	30
Registered by CSP	0.91	0	35	65
total	0.87	18	32	50

\* Fraudulent products include the 39% unregistered anywhere and the 6% registered in neighboring countries and then illegally smuggled into Mali.

Source: Haggblade et al. (2019).



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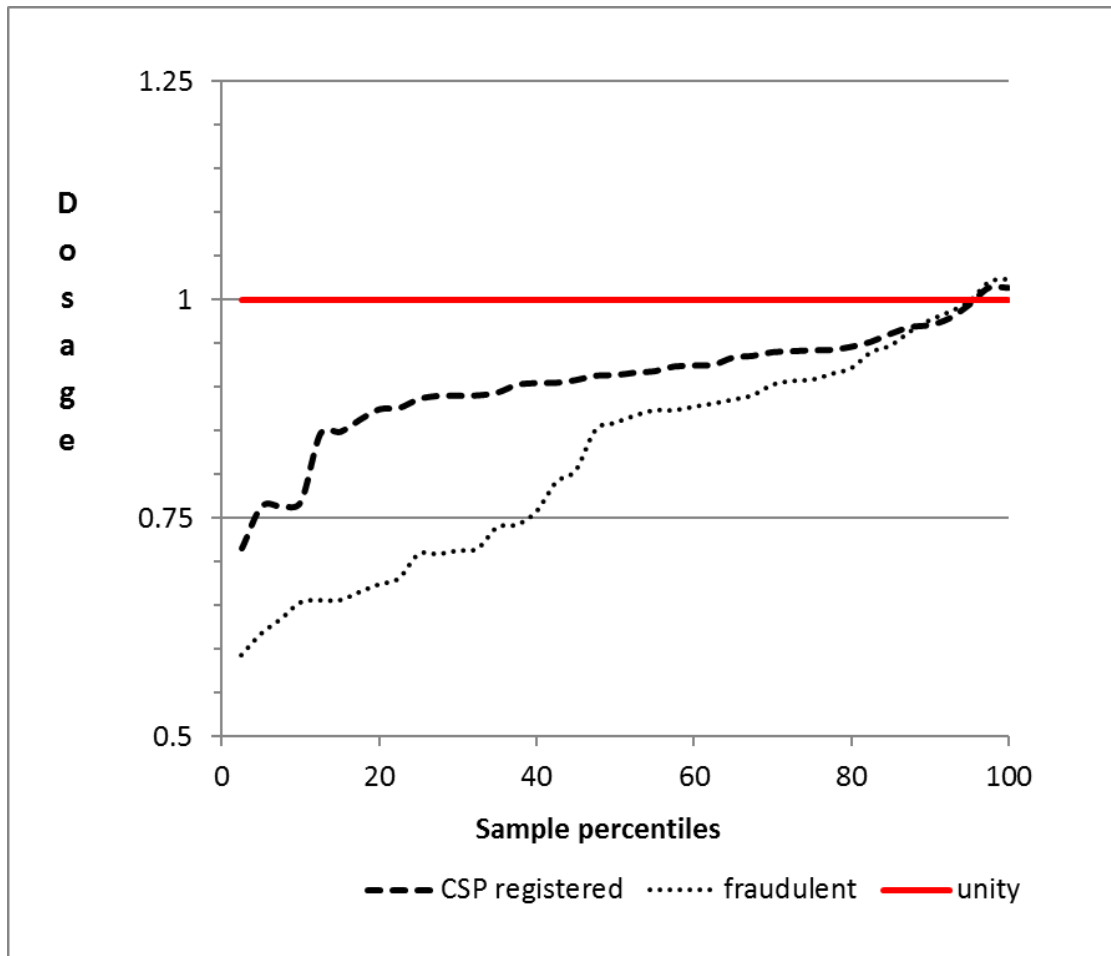
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# Fraudulent product quality

Figure 2. Dosage shares: lab result as % stated dosage



Source : Haggblade et al. (2019)

# Who registers pesticides?

Table 6. Who registers pesticides?

	Registration status			total
	CSP	none	other	
<b>Supplying firm type</b>				
International R&D	93%	5%	2%	100%
Local trading	28%	64%	9%	100%
<b>Manufacturing location</b>				
Europe	83%	11%	6%	100%
other	47%	37%	16%	100%
China	49%	48%	3%	100%
<b>Formulation</b>				
Group 1. 356 g/L	10%	80%	10%	100%
Group 2. 360 g/L	84%	12%	5%	100%
Group 3. 450 g/L	83%	17%	0%	100%
Group 4. 489 g/L	100%	0%	0%	100%
<b>All samples</b>	55%	39%	6%	100%

Source : Haggblade et al. (2019)

# 3. Key risks

## 1. Production risks

- Unreliable pesticide quality
- Uncertain production outcomes

## 2. Human health risks

- Residues in foods
- Contaminated water
- Exposure during spraying

## 3. Market risks

- Honest traders lose market share
- Frauds tarnish product reputation

# 4. Implications for action

## 1. Farmers

- Purchase only registered products

## 2. Regulators

- Improve market monitoring
- Invest in quality testing laboratories
- Monitor human health impacts in selected high-risk hot-spots

## 3. Industry

- Anti-fraud outreach (press, regulators, farmer groups)

## 4. Researchers

- Identify high-risk hot spots
- Monitor human health impacts in selected hot-spots
- Include blind duplicates in all testing



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