

Improving extension workers' numeracy skills to enhance the decision-making process for crop protection in Mozambique

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Current state of weed management in Mozambique

- Reliant on hand hoe weeding
- Labor limitations
- Shift to commercialized agriculture with extension worker support
- But... lack of training opportunities for extension workers

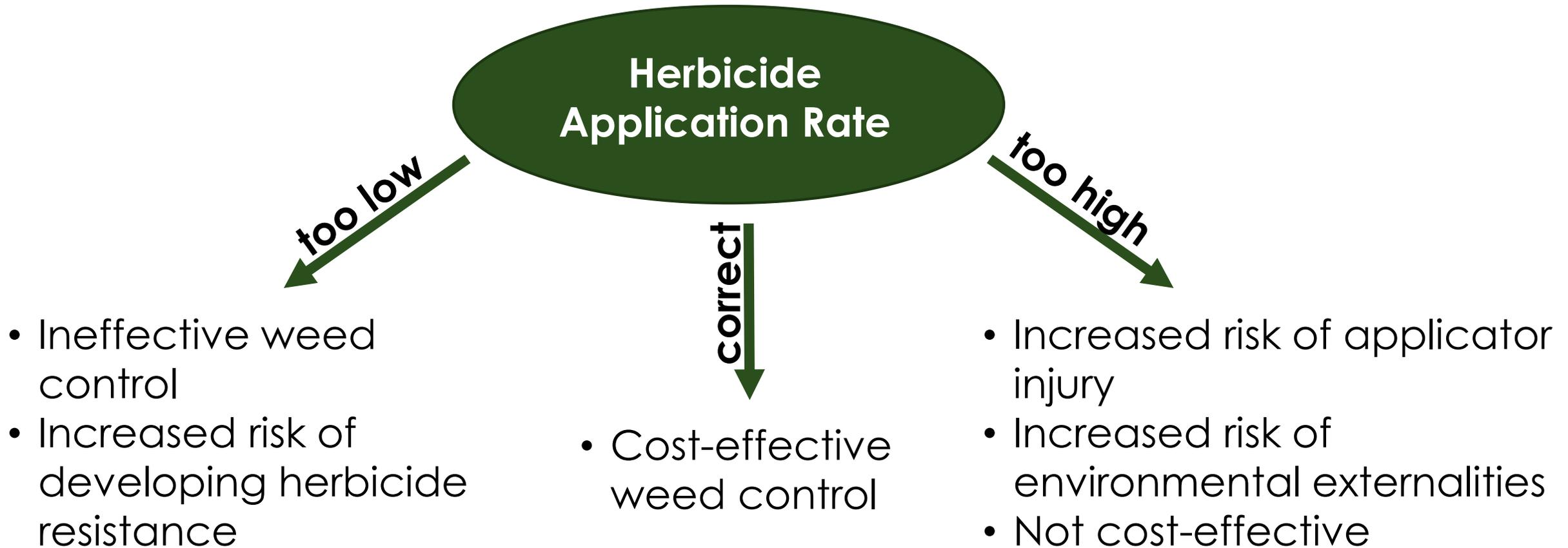


Image 1. Typical smallholder weeding system in sub-Saharan Africa (Nicole Lee, 2018)



Image 2. Pesticide label in Mozambique (Nicole Lee, 2018)

In a nutshell...



Numeracy skills are crucial to applying herbicides at the correct rate.

This problem isn't unique to Mozambique

- Pesticide licensing in many US states does not explicitly require strong math skills
- Math anxiety
- How do we increase level of comfort with math?

$$1) \text{ area sprayed (m)} = \frac{\text{swath(m)}}{\text{walking distance(m)}}$$

$$2) \text{ discharge rate } \left(\frac{l}{ha} \right) = \frac{\text{water in tank before spraying (l)} - \text{water in tank after spraying (l)}}{\text{area sprayed (m)}} \times 10\,000$$

$$3) \text{ herbicide per tank} = \frac{\text{recommended rate } \left(\frac{l}{ha} \right)}{\text{discharge rate } \left(\frac{l}{ha} \right) \times \text{tank capacity (l)}}$$

Mozambique Numeracy Project

- Collaboration between Soybean Innovation Lab and International Institute for Tropical Agriculture
- Angónia, Gúrue, and Nampula districts (north and northeast Mozambique)
- Integrated Pest Management (IPM) training course + numeracy skill development

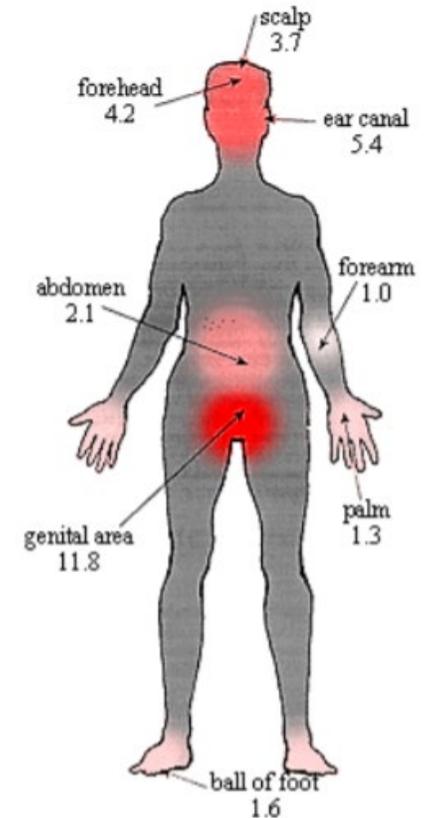


Image 3. Map of study sites in Mozambique (Google Earth, 2019)

THANK YOU

Importance of numeracy

- Numeracy skills are important for several reasons:
 - ✓ Correct herbicide dosage calculations, calibration, etc.
 - ✓ Related to understanding of risk
 - ✓ Related to decision making



Relative absorption rates, as compared to the forearm (1.0)

[British Columbia Ministry of Agriculture \(2017\)](#)