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## Introduction

Efforts to intensify cassava production have been stymied by weed infestations, which are mostly controlled by the use of hand (hoe) weeding—a system that is crude and drudgery-driven. Women spend hundreds of hours per annum to weed cassava (hoe weeding takes 50 to 80% of the total labor budget in Nigeria). In some cases, children are withdrawn from school to support weeding. To avoid the drudgery of hoe weeding, many rural farming communities in Africa are using herbicides with the help of knapsack sprayers. However, the challenge many farmers face is mostly wrong application of herbicides as many cannot manually calculate the quantity of herbicide needed to load in the sprayer per given operation.



Fig. 1: Herbicides application with knapsack sprayer.

## Benefits of the mobile app

The IITA Herbicide Calculator was developed by IITA using in-house capacity to help farmers and applicators of herbicides to calibrate themselves and apply the right quantity of herbicide per knapsack spray tank to avoid either overdosing or underdosing which leads to poor weed control, economic waste, development of resistant weeds, and environmental pollution.



Fig. 2: Features of the IITA Herbicide Calculator.



Fig. 3: Training of farmers on how to use the IITA Herbicide Calculator.

## How to use the IITA Herbicide Calculator

1. Enter the Dosage of the herbicide to be sprayed in Liter per Hectare as recommended on the herbicide label
2. Enter the Volume of Water dispensed on 10m x 10m plot. To get the Volume of Water sprayed on a 10m x 10m plot:
  - a. Measure a plot of 10m x 10m.
  - b. Fill water in your knapsack spray tank and spray the measured area normally on a straight path with the nozzle height at your knee level.
  - c. Enter the Volume of Water dispensed from your knapsack spray tank on the 10m x 10m plot.
3. Enter the capacity of your knapsack spray tank in Liters.
4. Press "Calculate Volume" to get the exact dosage of the herbicide that should be added into your knapsack spray tank before filling the tank with water for spraying.



Fig. 5: A field where IITA Herbicide Calculator was used to apply herbicides.

## Conclusion

Although developed in the context of cassava, the IITA Herbicide Calculator can be used in calibrating spray service providers controlling weeds in all crops. The mobile app received a 4.7 review rating on a scale of 5 from users who have downloaded it from Google play store. It has been deployed to spray service providers and farmers in Nigeria, Tanzania, Uganda and Zambia and with more than 1000 downloads. The IITA Herbicide Calculator can be downloaded from google play store.

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