

“Six Steps” cassava weed management

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Summary

Weed encroachment of fields is a major constraint in the production of cassava across Sub-Saharan Africa because farmers generally do not take adequate and timely measures to keep weed covers low. The planting arrangement of cassava and its slow canopy development make the crop susceptible to encroachment by weeds in the first 10-16 weeks of cultivation. When weeds are abundant on farms they guzzle up lots of nutrients and water from the soil, which is severely reducing the yield of cassava roots. The “Six Steps” approach is a complete package for weed management that addresses multiple key control measures, including site selection, weed identification, herbicides application, tillage operations, plant spacing, and post-emergence weeding. Cassava farmers in Nigeria who were trained in “Six Steps” weed management by large-scale dissemination programs have been harvesting fresh yield root yields of more than 20 ton/ha in comparison to the national average of 9 ton/ha.

Technical Description

“Six Steps” cassava weed management offers a decision support framework and recommendations on various control measures in line with prevalent conditions which is helping farmers to keep crops free of weeds and realize high root yields. The specific steps involve: 1) site selection, 2) slashing of vegetation, 3) land clearing with herbicides, 4) ploughing and ridging of fields, 5) planting and pre-emergence herbicide application, and 6) post-emergence manual and chemical weed control.

Uses

The “Six Steps” weed management strategy is tailored to the agricultural contexts and available resources of small-scale farmers, and can be applied in all cassava growing areas of SSA - from sub-humid savannahs and highlands to humid lowlands. Multiple forms of weed encroachment, i.e., grasses, broad leaves, and bush (trees), and different levels of coverage and height, are addressed in the stepwise approach that give cassava producers the opportunity to better align practices with prevalent conditions on their cropland.

Composition

Different types of equipment and herbicides are needed for implementing the “Six Steps” weed management strategy. Farmers can use simple, low-cost types of gear like

slashers, hand hoe and manual knapsack sprayers, or -if available- tractor mountable tools for land clearing and herbicide application.

Means of application

The “Six Steps” strategy is implemented using a compact, two-page document which takes farmers through a series of questions that guide them to the appropriate weed management and planting practices for cassava production under diverse conditions on farms. Procedures for land clearing, tillage, planting, and pre- and post-emergence weed control are described in detail through pictures and text which make it easy to follow. Site selection and land clearing typically starts 2 weeks before planting, and weed control through chemical and physical measures is carried out until cassava crops are fully shading the soil beneath, which can take up to 20-24 weeks after planting. To determine the suitable type of herbicide product, and its application rate and method, farmers can make use of the freely-available calculator applications for cassava crops (featured here on the ProPAS webportal). Inputs of nitrogen, phosphorus and potassium fertilizers have to be applied at recommended dosages and times during cultivation for achieving full root yield potential.

Agroecologies	Dryland area, Highlands, Humid forest, Moist savanna.
Regions	Africa South of Sahara.
Developed in Countries	Democratic Republic of the Congo, Nigeria, Tanzania, Zambia.
Available in	Democratic Republic of the Congo, Nigeria, Tanzania, Zambia.
Solution Forms	Management.
Solution Applications	Weed control.
Agricultural Commodities	Cassava.
Target Beneficiaries	Small-scale farmers, Commercial farmers.

Commercialization

Commercialization Category

Commercially available

Startup Requirements

1) Raising awareness about its benefits on cassava root yields, input efficiency and resilience, 2) Disseminating the decision support tool and recommendations via farmers own lines of communication or local extension agencies, and 3) Ensuring access to small loans that help offset initial investments for herbicide application and labour.

Production Costs

The “Six Steps” toolkit offering decision support and recommendations for weed management and planting practices can be downloaded free-of-charge from the internet. Substantial investments from farmers are needed to keep cassava crops free of weeds, with removal taking up 30% - 50% of total labour costs at respectively US \$28-46 per hectare, and herbicide applications with manual knapsack sprayers usually costing US \$20-30 per hectare.

Customer Segmentation

Subsistence and commercial cassava growers, Public extension agencies, Agricultural service providers

Potential Profitability

The “Six Steps” toolkit ensures that farmers are taking adequate and timely measures to control weed encroachment, and warrants larger returns on labour and herbicide investments for cassava production. A well-weeded cassava farm can achieve a 30-50% greater root yield than a poorly weeded farm, and the efficiencies of fertilizer inputs and water use are also significantly enhanced by following the good practices for weed management and planting.

Licensing Requirements

Farmers do not require licenses for manual and mechanized removal of weeds, while the application of herbicide on farms is subject to environmental regulations and permissions in some countries of SSA.

Innovation as Public Good

Manuals and tutorials for implementing the “Six Steps” weed management and planting practices in cassava production are developed and disseminated as a regional public good by the International Institute of Tropical Agriculture.

Solution Images



Aperçu des pratiques de l'approche en 6 étapes



Institutions



Accompanying Solutions

Selective herbicides, Mechanized weeders, Inorganic fertilizers