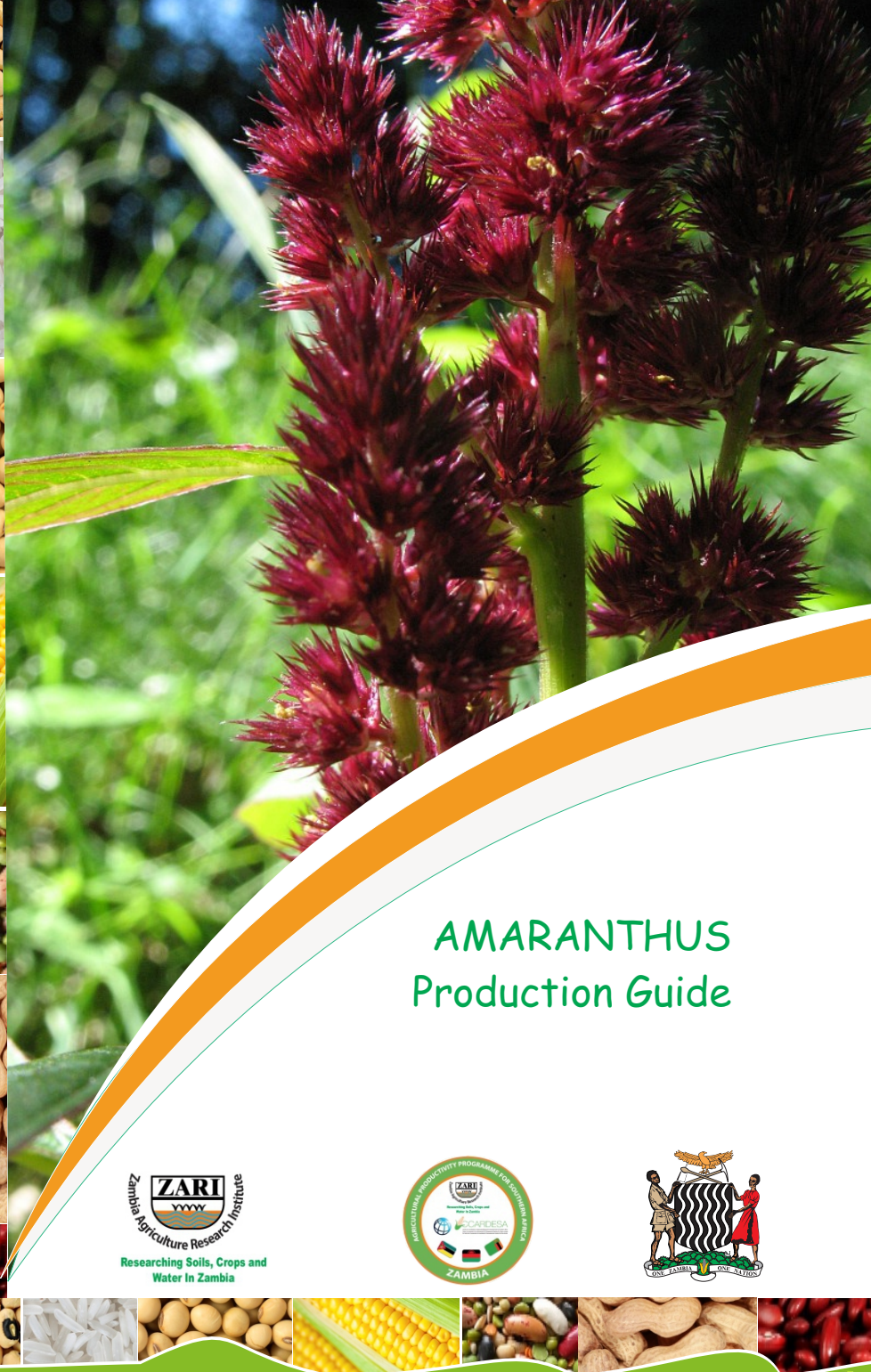




# AMARANTHUS Production Guide





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## Foreword



Zambia has the potential to produce sufficient food for its citizens and for export.

In order to ensure that good agricultural practices are employed by farmers, crop specific production information should be made available to them.

Due to technological advances and the changing environmental and socio-economic conditions it became necessary to revise the first edition of the Amaranth Production Guide, which was published in 2002. This revised edition is meant to provide farmers and other stakeholders crop specific information in order to promote good agricultural practices and enhance productivity and production.

The information contained in this booklet has been generated over a number of years of research and is appropriate for all categories of farmers. The information is meant for extension officers, agricultural training institutions and other development partners. It is my sincere hope that this information will go a long way in stimulating Amaranth production in Zambia.

The Zambia Agriculture Research Institute (ZARI) is committed to alleviating poverty and enhancing food security by contributing to increased and sustainable food production.

A handwritten signature in blue ink, consisting of stylized initials and a surname, likely 'M. Mwale'.

M. Mwale  
Director,  
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## Acknowledgements

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## **1.0 Introduction**

Amaranth (*Amaranth spp.*) is a fast growing wild or semi-cultivated annual plant from the Amaranthaceae family. Many species of the plant exist. Leaves and tender shoots are popularly used as traditional vegetable relish throughout Zambia. In some countries, amaranth seed is valued for its high protein content, offering considerable potential where malnutrition is endemic. Amaranth greens are a rich source of Vitamin A, calcium, iron and other minerals. The plant reaches a height of up to two meters. Most amaranth in Zambia is semi-cultivated, although cultivated types and varieties are available. Like most vegetables, Amaranth can be planted throughout the country.

## **2.0 Climatic and Soil Requirements**

### **2.1 Climate**

The crop can be grown throughout the year, though the best performance is during the period August to April. However, the best time of planting to achieve maximum leaf production is from August to October. Amaranth is a short day plant and may bolt early when planted during periods shortened day length. For commercial leaf production it is best to plant when day length is increasing and temperatures are rising. High temperatures and dry weather conditions characterise the months of August to October. Thereafter, November to April is relatively warm and humid as it covers the rainy season. Amaranth is also relatively drought tolerant.

## 2.2 Soil Types

Amaranth grows in all soil types, though soils rich in organic matter with a pH range 5.5-7.5 are preferred.

## 3.0 Recommended Varieties

There are two recommended varieties, UNZA A1 and UNZA A2, developed by the University of Zambia.. Their characteristics are given in the table below.

| Variety | Seed colour | Leaf colour | Utilisation                    |
|---------|-------------|-------------|--------------------------------|
| UNZA A1 | Black       | Dark green  | Only leaves                    |
| UNZA A2 | White       | Light green | Dual purpose (leaves and seed) |

## 4. Recommended Management Practices

### 4.1 Land Preparation

The seeds of amaranth are very small. The seed bed should therefore be well prepared to a fine tilth without clods and crusts to easy seedling emergence.

### 4.2 Planting

The seed is sown directly in the field either as a mono crop or intercropped with other crops. The recommended seed rate is 2 kg seed /ha and the fine seeds can be mixed with sand at a ratio of 1:100 to make them easier to spread evenly, and sown at a depth of 0.5 to 1.5 cm in rows 20-30 cm apart, or by broadcasting onto the bed. Cover the seeds with a thin layer of soil followed by watering. Seeds may also be broadcasted on old rubbish dumps and old kraal sites

where other traditional vegetables like Corchorus, Cleome and pumpkin are growing. If sown in rows, seedlings should be thinned three weeks after sowing when they have 3-4 true leaves. Allow 10-15 cm between plants. If seed was broadcast, allow up to 5 cm spacing between plants.

### **4.3 Weed Control**

It is recommended to keep the crop free of weeds, including other uncultivated amaranth types, due to the low competing ability of the cultivated varieties. This is important when the crop is young and to avoid contaminating the harvests when the plants are uprooted for sale.

### **4.4 Fertiliser Application**

In soils low in organic matter and depending on the fertility status, a fertiliser application of 300 kg/ha 'D', 'X', 'R' or 'C' compound should be applied as basal dressing before sowing or at sowing time. Top dressing with ammonium nitrate at the rate of 100 kg/ha is required 2 weeks from emergence. Apply compost or livestock manure at 2 to 3 kg/m<sup>2</sup> before sowing.

### **4.5 Irrigation**

For the irrigated crop the amount of water and frequency of irrigation is dependent on prevailing climatic conditions, soil types and the crop development stage. In general the amount to irrigate is 20 minute pumping with a treadle pump on a 100 m<sup>2</sup> plot or bucket of 15 litres per m<sup>2</sup>.

#### **4.6 Crop Rotation Practices**

Avoid following an amaranth crop with another amaranth crop, in order to avoid nutrient imbalance and buildup of pests and disease.

#### **5.0 Crop Protection**

Amaranth is susceptible to a number of insect pests and diseases that reduce the yield and quality of the produce. There are measures that can be taken to minimize the damage.

##### **5.1 Major Diseases and Control Measures**

Cercospora leaf spot and Albugo white rust are the most common diseases. To control these diseases spray Dithane M-45, or similar fungicides, applied at 15 days interval.

##### **5.2 Major Insect Pests and Control Measures**

Leaf eating caterpillars and beetles are the major pests of amaranth. These can be controlled by avoiding continuous cropping with amaranth. If the attack is serious, a spray with Alfamethrin (fastac) as per manufacturer's recommendation, one or two sprayings, is often adequate for the whole growing season.

#### **6.0 Harvesting**

The harvesting for leaf vegetables can start at 6 weeks after planting and may continue for 4 weeks. The seed is harvested after attaining physiological maturity, which is 10-12 weeks after planting.

## **7.0 Post-Harvest Handling and Processing**

In Zambia, amaranth is basically consumed as fresh green vegetables. However, in other countries, amaranth leaves, stems and seeds are processed and used as ingredients in the production of pancakes, cookies, breakfast cereals, muffins, drinks, soup and other products.

Harvested leaves for sale should preferably be packed in polythene bags to reduce wilting and the ultimate loss of quality.

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