



# PYRETHRUM NURSERY MANAGEMENT



**NAVCDP**

NATIONAL AGRICULTURAL VALUE CHAIN  
DEVELOPMENT PROJECT

## Introduction

A pyrethrum nursery is an area designated for the germination of seed, nurturing, and hardening of seedlings before they are transplanted into the field.



*A pyrethrum nursery and (Sources: KENTEGRA and KALRO Molo)*

## Site selection

Factors to consider:

1. The topography of land at the nursery site must be even. In hilly areas, the site must be divided



*A nursery established from split (Sources: KENTEGRA and KALRO Molo)*

## Importance of a Nursery

1. Ensures multiplication and availability of healthy and vigorous seedlings
2. Contribute to the preservation of the genetic diversity
3. Prevent the spread of diseases and pests.
4. Ensures farmers have continuous access to high-quality planting materials

All pyrethrum varieties are propagated through seed in a nursery. It is mandatory to use certified seed from a reputable source.

- into levelled terraces.
2. The site is located on fallow or previously tilled land where possible virgin land, Land not planted with pyrethrum or any crop Solanaceae family for three to six years.
3. The land should be free from water logging.
4. The soils must be free draining, preferably loam or sandy loam with high organic matter content, adequate water retention capacity, and aeration.
5. Soil testing before propagation of seed is recommended to determine the nutrient content and to guide in the efficient use

- of fertilizers and manures. Soil is the recommended media for use
- The water source should be free of any contamination and adequate for irrigation.
  - The site should be accessible by road and not far from potential markets.

### Procedure for raising varietal seed nursery beds

For a nursery that multiplies pyrethrum varieties through the propagation of seeds. The procedure for the preparation and care of a seed nursery is as follows: -

- Cultivate the land to a fine tilth
- Construct raised beds, 15cm high, 1 m wide and of any convenient length. 80 meter bed length will produce enough seedlings to plant 1 acre)
- Make straight furrows, 1.25 cm

2.5 cm length. Do not pour seeds in clusters. 250 g of seed will give enough seedlings to plant 0.5 hectares (1.23 acres)



*Furrow making on seed beds and planting of seed. (Source: KALRO Molo and KENTEGRA)*



*Well-raised pyrethrum seed bed (Source: KENTEGRA)*

- Do not cover the seed with soil.
  - Cover the seedbed with seedless dry grass mulch and water thoroughly
  - Germination takes 10-18 days, after which the grass mulch should be removed gradually to allow the tender seedlings to acclimatize and become hardened
  - Top-dress with CAN (26%N) at 400 kgha-1 three months after germination
- deep and 15 cm apart, using a stick
  - Spread seeds evenly in the furrows at a rate of 10 seeds per



Correctly placed and wrongly placed pyrethrum seeds during planting.  
(source Muriithi Irene, KALRO Molo)



Seedbeds covered with grass mulch  
(Sourc: KENTEGRA)

9. Seedlings should be transplanted after 4 5 months when about 15 cm tall.

## Procedure for raising clonal nurseries

For the multiplication of clonal materials propagated vegetatively using splits, nursery operators should source material from certified nurseries. The procedure is as follows:

1. Cultivate the land to a fine tilth two weeks before planting.
2. Make 15cm deep holes, spacing at 15 cm between the lines and 15 cm between the holes in each line.



Pyrethrum seedlings after germination (Source: Micah Thuo. KENTEGRA)

3. Split up the clonal material within 24 hours of uprooting before transplanting.
  4. Apply Triple Superphosphate fertilizer at a rate of one teaspoonful per planting hole
  5. Deep splits in a nematicide solution to control existing nematodes.
  6. Place a single split into each planting hole making sure the roots are straight
  7. Press the soil against the roots and ensure the soil reaches just above the root level
  8. Irrigate the nursery as sufficiently.
  9. Plants are ready for splitting and replanting in a commercial field after 3-4 months.
- Approximately 4,000 mature plants are required to raise enough splits to plant an acre (22,000 plants for an acre) with 5-10 splits per plant.



- In drier places with a spacing of 30 x 90 cm, 3,000 plants are required to split into approximately 14,000 splits to plant an acre.

## Management Practices

### Weed control

Seed nurseries should be weed-free at all times. Major weeds of concern found in seed beds are Brassicas, oxalis, couch grass, sedge and Kikuyu grass.

### Disadvantages of weeds

- They pose competition with pyrethrum seedlings for sunlight, water, air and nutrients.
- They act as secondary hosts for insect pests and disease-carrying organisms.
- Gentle manual weeding is emphasized to avoid uprooting or damaging the tender pyrethrum seedlings.



*Pyrethrum splits ready for planting (Source: Muriithi Irene, KALRO Molo)*

## Pest and disease control

Nurseries should be free from pests and diseases at all times to prevent the transfer to farmer fields. Seedlings are tender and hence vulnerable to attacks from pests. The most important pests infesting pyrethrum are root-knot nematodes, thrips, green aphids and red spider mites.

Pyrethrum seedlings are affected by fungal diseases that cause root rot, a complex of diseases caused by several fungi species namely, *Fusarium* spp., *Fusarium graminearum*, *Fusarium oxysporum*, *Fusarium solani*, *Sclerotinia minor*, *Rhizoctonia* spp, *Aschochyta* spp, *Pythium* spp., *Sclerotinia sclerotium*, *Phoma* spp and *Diplodia* spp.

### Cultural methods of control

1. Use of certified, clean planting material that is resistant to pests



Weeds of concern in Pyrethrum  
*Oxalis* (source: Infonet)



Manual weeding at pyrethrum nurseries (Source: Nancy Njogu)



*Aphids, trips (source Infonet) and moles (Source: Collins, KENTEGRA)*

and diseases.

2. Proper sanitation, keep the seedbed area clean by removing crop residues and weeds, as they can harbour pests and diseases.

### **Chemical control**

It is also recommended that pesticides should be applied against target pests strictly following manufacturer's guidelines.

### **Watering**

Adequate watering ensures that young seedlings receive the necessary moisture for germination and early vigorous growth. Nursery beds should be watered regularly using a watering can or a hosepipe with a nozzle to ensure uniform water distribution, and to avoid disturbing the soil and delicate seedlings. Keep the seed bed consistently moist but not waterlogged. The soil should be damp to the touch, but not saturated. Water the whole seedbed and not just plants.



*Pesticide application on pyrethrum seedlings in the nursery (Source: Micah Thuo, KENTEGRA)*

## Uprooting the seedlings for transplanting

Seedlings are transplanted after 4-5 months when about 15 cm tall, with well-established root systems. Each seedling is an individual plant. Uproot clusters of seedlings and carefully separate into individual plants.

The seedlings should be planted within 24 hours after uprooting to prevent losses due to drying out. Seedlings should be packed in crates during transport.

## Nursery Certification and Licensing

Legally, all pyrethrum nurseries must be certified by the Kenya Plant Health Inspectorate Service (KEPHIS) and licensed by the Agricultural Food Authority (AFA). This is done after thorough inspection to ensure that nurseries comply with all regulations, ensuring that planting materials that are provided to farmers are of high quality and free from pests and diseases.



*Individual seedlings ready for transplanting in the field  
(Source: Collins, KENTEGRA)*



## List of licensed pyrethrum commercial nursery operators as of 31<sup>st</sup> December, 2023

### NAME COUNTY SUB-COUNTY

Jatflora Ltd	Nakuru	Gilgil
Grow-Tech Nurseries Ltd	Nakuru	Rongai
Malewa Pareto Dealers Limited	Nakuru	Starehe
Thuwaka Investments Company	Nakuru	Nakuru East
Krislar Enterprise	Nairobi	Kamukunji
Leafsite Enterprise	Nakuru	Njoro
Pambio Trading And Ventures	Nakuru	Naivasha
Pyfarm Enterprises	Nakuru	Bahati
Wycha Agrofarm Limited	Nakuru	Gilgil
Karose Ukulima Enterprises	Nakuru	Nakuru East
Old Land Enterprises Limited	Nakuru	Molo
Babuye Investment Limited	Nakuru	Subukia
Seeknow Investment	Nakuru	Bahati
Susdep Ventures	Nakuru	Bahati
Pynur Co Limited	Nakuru	Nakuru East
Molona Enterprises Co. Ltd	Nakuru	Nakuru East
Teibo Enterprise	Nakuru	Njoro
Waluca Investment	Nakuru	Subukia
Muhiass Paretos Limited	Nakuru	Bahati
Japafa Enterprise Limited	Nakuru	Subukia
Duicker Holdings Ltd	Nakuru	Nakuru East
Jages Heights Enterprises Limited	Nakuru	Nakuru East



**Compiled by:** Obanyi, J. Muriithi I., Wandera F., Njogu N.,  
Kimutai C., Thuo M., and Imbwaga C.

**Edited by:** Nyabundi K.W., Mukundi K.T., Kinyua Z., Kivuva B.  
Maina P, and Wanyama H.N

**Design and Layout:** Nogrecia Mnene

**For further information, contact:** The Centre Director  
KALRO Molo-Industrial Crops Research Institute  
P.O. BOX 100-20106, Molo  
[Kalro.molo@kalro.org](mailto:Kalro.molo@kalro.org)

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