



KALRO improved solar drier recommended for pyrethrum flowers (Source: KALRO Molo)

4. Combustion drying of pyrethrum flowers

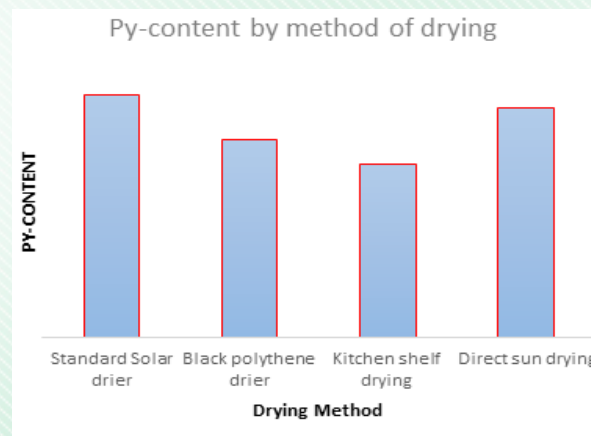
This method involves drying pyrethrum flowers using hot air generated through biogas or electricity. The flowers typically dry within a day.

Relationship between drying method and pyrethrin content
Relationship between drying method and pyrethrin content
The optimum drying temperatures should range between 45-50°C. These conditions can be safely achieved through sun-drying and solar drying methods. Lower temperatures may result in incomplete drying, leading to fermentation and a subsequent reduction in quality. The fermentation process often results in the presence of moldy flowers, characterized by a black appearance. On the other hand, higher temperatures may lead to the degradation of pyrethrins and a decline in quality.

Packaging of dried flowers

The dried flowers should be carefully packaged in recommended 90-100 kg jute or sisal gunny bags and promptly transported to the collection center or processing factory. Packaging should be conducted gently to prevent the breaking and spillage of the flowers during handling. Each bag should contain 30 kg of dry flowers. Once packed, the dried flowers should be sent to the processor immediately. Prolonged storage of dry flowers

(more than 1 month) should be avoided, as it leads to the loss of pyrethrins. In the event of any incidental delay, flowers should be stored in dry, cool, and well-ventilated places on raised racks away from sunlight and on raised pallets made of either plastic or wood, away from the walls. At the factory level, dry flowers are stored in silos that are kept completely dark or under carbon dioxide to prevent the rapid loss of pyrethrins.



Effect of pyrethrum drying method on pyrethrin content (Source: Collins Kimutai, KENTEGRA)



Compiled by: Otieno, M.

Edited by: Nyabundi, K.W., Mukundi, K.T., Maina, P. and Otieno, A.S.

Design and Layout: Nogrecia Mnene

For more information, Contacts: The Centre Director
KALRO Molo-Industrial Crops Research Institute
P.O. BOX 100-20106, Molo
Kalro.molo@kalro.org
KALRO/NAVCDP/ Brochure No. 140/2024



METHODS OF DRYING PYRETHRUM FLOWERS



Introduction

Drying the flowers is one of the most essential postharvest activities that determine the content of pyrethrin retained in the dry flowers. Picked flowers should be dried at the farm level immediately to avoid a loss of quality. Several drying practices are described below:

1. Sun drying flowers in raised trays

Wooden trays are constructed and raised 1m above the ground to facilitate air circulation and prevent contamination with soil. The flowers are spread on the trays in a layer not exceeding 11 cm deep and overturned regularly during the drying period (Figure 6). Flowers take 3 to 4 days to dry during normal weather conditions, and 5 to 7 days during cloudy conditions.

The flowers are considered optimally dry when four out of five flower heads shatter easily when squeezed between the thumb and forefinger. Well-dried flowers have a dry green appearance of the bract, no rancid smell due to rotting, and are not moldy. The moisture content of dry flowers should be less than 13%.



Drying of pyrethrum on polythene (Source: Lusike Wasilwa-KALRO and Collins Kimutai - KENTEGRA)



Well-dried flowers (Source: Lusike Wasilwa-KALRO and Collins Kimutai - KENTEGRA)

2. Sun Drying Flowers in Tarpaulins

Farmers also dry the flowers by spreading them on materials such as tarpaulins. However, some farmers choose to dry the flowers by spreading them on bare ground under the dry sunshine (Figure below). This practice often results in soiling and fermentation of the flowers, leading to a reduction in quality. Sun drying proves to be cost-effective for small-scale production, with minimal pyrethrin loss.



Sun-drying of pyrethrum flowers on tarpaulin (Source: Caroline Imbwaga, PPCK; Atieno 2021)



Drying of pyrethrum flowers on the ground (Source: Caroline Imbwaga, PPCK; Atieno 2021)

3. Drying of pyrethrum flowers on solar driers

This process involves drying picked pyrethrum flowers using solar radiation collected by solar driers. The flowers typically dry in 1 to 2 days under favorable weather conditions but may take 6 to 7 days during cloudy conditions.

The advantages of using a solar dryer include faster drying, resulting in clean and dry flowers, less flower loss, reduced fermentation, higher flower quality with increased pyrethrin content, and ultimately, greater income. Furthermore, it proves to be a cost-effective solution as construction materials are readily available, and its simplicity makes it a viable option for enhancing the drying process for pyrethrum flowers.

