Pyrethrum was introduced in Kenya from Europe in the late 1920s. It started as a large-scale crop, but today it is widely cultivated in the highlands of East Africa by small-scale farmers. Kenya produces about 70% of the world supply. The success of pyrethrum cultivation is attributed to good weather conditions and source of natural pesticides.

1.0 Introduction

1.1 Background Information

Pyrethrum (Chrysanthemum cinerariaefolium) is a perennial crop with a daisy-like appearance and white flowers that possess insecticidal properties. It was introduced in the county by white settlers in 1928. Pyrethrin, the insecticide produced from this plant is the oldest insecticide known to man and well recognized for low mammalian toxicity and is not persistent in the environment. It rapidly knocks down and kills a wide range of insect pests.

Over the years, the production of the crop increased steadily and during the 1980s and 1990s, Kenya was a global leader in pyrethrum production, accounting for over 70 percent of the global market. The sub-sector supported more than 200,000 small-scale growers, 3,000 workers directly employed by the Pyrethrum Board of Kenya and over 2 million people deriving their livelihood from the industry either directly or indirectly. The sub sector was a major foreign exchange contributor with earnings rising up to KSh. 2.1 billion in 1996.

The pyrethrum industry has however suffered a steady decline starting from early 1990s when production declined from about 18,000 MT in 1991 to about 4,000 MT in 1999 (see Figure 1). The decline was caused by among other reasons: non conducive policy and regulatory environment; unmet demand; mismatch between market requirements and production (cyclic trend), farm level issues such as low productivity and profitability, scarcity of planting
materials, high costs of production, delayed payments to farmers, and increased competition from synthetics.

![Graph](image-url)

Source: PBK, 2013

**Figure 1: Pyrethrum Production in Metric Tonnes from 1970 to 2000**

Flower deliveries to PBK factory in Nakuru have been declining in the last five years for reasons alluded to earlier with subsequent drop in productivity. This underpins the importance of tackling farm level issues such as access to clean and high quality planting materials, provision of extension services and prompt payment to farmers on deliveries to ensure a vibrant pyrethrum sector back to its former fame.

Transforming the former Pyrethrum Board of Kenya by separating the regulatory and commercial roles through establishment of the Pyrethrum Regulatory Authority (PRA) and the Pyrethrum Processing Company of Kenya Ltd is in progress/policy direction as stipulated in the current legal framework, Pyrethrum Act, N0. 22 of 2013……read more …[download ]

Pyrethrum is grown in 19 counties in the country namely Nakuru, Kiambu, Nyandarua, Nyeri, Laikipia, Meru, Embu, Baringo, Elgeyo Marakwet, West Pokot, TransNzoia, Bungoma (Mt. Elgon), Uasin Gishu, Nandi, Kericho, Bomet, Kisii, Murang’a, and Nyamira (Figure 2) here below.
Today Pyrethrum benefits many people worldwide - from the subsistence farmer growing pyrethrum as a cash crop, to families burning pyrethrum mosquito coils to avoid malaria, and the hobby gardener spraying vegetables.

**ECONOMIC IMPORTANCE, CONTRIBUTION TO GROSS DOMESTIC PRODUCT GDP AND LIVELIHOOD**

Pyrethrum is an important crop in Kenya which in the 1980’s and 1990’s offered livelihoods to over 200,000 small-scale growers. It was a major foreign exchange earner that once ranked fourth behind coffee, tea and horticulture. The crop earned a peak of Ksh.2.1 billion in 1996 but has since declined to Ksh.130 million in 2010.

The number of farmers dwindled from 200,000 in the 1980s to 29,000 (June 2009) and the area under the crop dropped from 40,000 ha during the 1980s to 4,000 ha (2009). Production has also
reduced from a high of 18,000 MT in 1981/82 to 462 MT realized 2009/2010 pool year. The
producer price range has stagnated at Ksh. 100 to Ksh. 300 per Kg since 2001 depending on the
pyrethrins content.

Kenya has potential to produce and process upwards of 20,000 MT of pyrethrum flowers to earn
Ksh. 7.5 billion for farmers per year and Ksh. 5.8 billion in foreign exchange from the refined
extract (Pale) alone. The pyrethrum sub-sector can provide a livelihood to 2-3 million people
with direct or indirect linkage to PBK. PBK alone can employ at least 3,000 workers if utilised at
its full capacity.

Despite the challenges facing the pyrethrum industry, it has the potential to increase export
earnings, promote industrialization, and spur growth of the economy. Indeed the Kenya vision
2030 identifies pyrethrum as one of the sub sectors that will significantly contribute to economic
growth. The Agricultural Sector Development Strategy (ASDS) also recognizes the need for
commercial orientation, modernization, food security and value addition in Agriculture, in which
pyrethrum plays a significant role. It is in view of the foregoing that the government has
committed itself to restructuring the sector to improve efficiency and competitiveness.

INPUTS FOR PYRETHRUM PRODUCTION

Pyrethrum is propagated by splits/crown division and seed/seedlings that are mainly produced by PRA in
the satellite farms and through licensed nursery operators

The seedlings are usually grown in a seedbed; and on attaining 4 or 5 inches high, they are
transplanted to the field on a spacing of 30 x 60-90cm.
i. Clean planting material

Clones and Varieties: Superior varieties are developed by Pyrethrum Regulatory Authority (former PBK) in collaboration with KALRO at Molo research Centre. The recommended varieties are as shown here below (Table1).

Table 1: Recommended clones and varieties of pyrethrum for growing in Kenya.

<table>
<thead>
<tr>
<th>Altitude</th>
<th>Clones and varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>High altitude</td>
<td>Clones: SB/66/107, Ma/71/423, Ma/70/1013, Mo/74/223, L/75/477, L/75/487</td>
</tr>
<tr>
<td></td>
<td>Varieties: P4</td>
</tr>
<tr>
<td>Medium to Low altitude</td>
<td>Clones: Ks/75/336, Ks/70/64, Ks/75/313, Kr/74/122;</td>
</tr>
<tr>
<td></td>
<td>Varieties: K218, K235</td>
</tr>
</tbody>
</table>

There has been a significant increase in crop expansion to 8,200 Ha (March 2012). The number of farmers has increased to 40,000 (June 2011). The Board has distributed clonal seedlings and seed to farmers’ nurseries to improve production. Together with intensive inter-farm transfers through splits/crown division of clonal material in response to extension campaigns, crop acreage expansion is being realised.

ii. Fertilizer application

Gapping done using pyrethrum splits

A seedling ready for transplanting
The other inputs include Fertilizer of 5g DAP per hole at planting and 250-300kg/ha of TSP per hole after cutting back. Manure of 10 ton/ha (a handful per hole) for poor soils 3 months before planting is recommend.

iii. **Pesticides** / see tables on pests and diseases control under production section (Table...)

**PYRETHRUM PRODUCTION**

**Climatic conditions, ecological zone**

It is grown in Altitude of 1800-3000m a.s.l with a rainfall above 750mm pa. The soils are expected to be fertile, deep and well-drained, loamy volcanic soils with a pH >5.6. The temperature should be less than 18°C for at least 6 weeks.

**Ecological Requirement**

<table>
<thead>
<tr>
<th>Altitude:</th>
<th>1800-3000m a.s.l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall:</td>
<td>Above 750mm pa</td>
</tr>
<tr>
<td>Soils:</td>
<td>Fertile, deep and well-drained, loamy volcanic soils, pH &gt;5.6</td>
</tr>
<tr>
<td>Temperature:</td>
<td>Less than 18°C for at least 6 weeks.</td>
</tr>
<tr>
<td>Land preparation:</td>
<td>Plough before the onset of rains and eliminate perennial weeds.</td>
</tr>
</tbody>
</table>

Plough before the onset of rains and eliminate perennial weeds. Planting is done in holes of 10x15cm. Propagate clones by splitting of mature plants or tissue-culture. Raise varieties in a nursery first but uproot and discard after 4 years. In Kenya, pyrethrum is cultivated almost entirely by small-scale farmers. The crop is favoured by cool temperatures, which occur in the higher altitude (1800-2900m). Higher temperatures and dry weather have negative effects on flower yields and pyrethrins content.

**Planting:** Holes 10x15cm. Propagate clones by splitting of mature plants or tissue-culture. Raise varieties in a nursery first but uproot and discard after 4 years.

**Spacing:** 30 x 60-90cm.

**Cutting back:** Done annually near the end of the dry season followed by weeding and earthing up. However, a new crop is established after 3-4 years.

**Fertilizer:** 5g DAP per hole at planting and 250-300kg/ha of TSP per hole after cutting back.

**Manure:** 10ton/ha (a handful per hole) for poor soils 3 months before planting.

**Weeding:** This operation can either be carried out through mechanical or chemical methods.
i. **Mechanical weeding:** With forked implements from the first month after establishment until the crop has fully covered the ground. After 2-3 months, earth up to encourage tillering

ii. **Chemical weeding:** Use herbicides e.g. Sencor, Venzar-Sencor-Ronstar

**Rotation:** Once every 3-4 years

**Intercropping:** Intercrop with short duration legumes after crop cutting back

---

**Table 2: Important pests and their control in pyrethrum growing**

<table>
<thead>
<tr>
<th>Pest</th>
<th>Symptoms</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pyrethrum thrips</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Onion or Flower</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(nigropilosus, tabaci)</em></td>
<td>− Dirty silvery patches on leaves.</td>
<td>− Use insecticides such as Anthio, Lebacid and Metasystox</td>
</tr>
<tr>
<td></td>
<td>− Brown disc florets and ray florets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>− Premature drying of flowers</td>
<td></td>
</tr>
<tr>
<td><strong>Green Peach aphids</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(Myzus persicae)</em></td>
<td>− Distorted young shoots and leaves.</td>
<td>− Use insecticides such as Anthio, Lebacid and Metasystox</td>
</tr>
<tr>
<td><strong>Red spider mites</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(Tetranychus hudenii)</em></td>
<td>− Yellow mites that turn to dark red</td>
<td>− Use insecticides such as Anthio, Leaked and Metasystox</td>
</tr>
<tr>
<td><strong>Root Knot Nematode</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(Meloldogyne hapla)</em></td>
<td>− Root knots</td>
<td>− Use clean planting material</td>
</tr>
<tr>
<td></td>
<td></td>
<td>− Plant tolerant clones/varieties</td>
</tr>
<tr>
<td></td>
<td></td>
<td>− Rotate with grass or cereals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>− Use of nematicides e.g. Nemacur/ Mocap at planting</td>
</tr>
<tr>
<td><strong>Moles</strong></td>
<td></td>
<td>− Trapping or Fukokill</td>
</tr>
<tr>
<td></td>
<td>− Withering and death of plants</td>
<td></td>
</tr>
</tbody>
</table>

**Important diseases and their control and their control**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Symptoms</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>True bud diseases</strong></td>
<td>− Dry flower buds that turn</td>
<td>− Use clean planting material</td>
</tr>
<tr>
<td>Disease Type</td>
<td>Symptoms</td>
<td>Control Measures</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Ramularia bellunensis</strong> &lt;br&gt;<strong>Alternaria sp</strong> and <strong>Ascochyta sp</strong></td>
<td>brown or purplish grey &lt;br&gt;− Retarded flower growth &lt;br&gt;− Deformed bud or flower</td>
<td>− Remove (Rogue) infected plants &lt;br&gt;− Cut back at the end of the season and discard/burn the stalks &lt;br&gt;− Plant resistant varieties</td>
</tr>
<tr>
<td><strong>False bud disease</strong> &lt;br&gt;<strong>(Aphelenchoides rttsema-bosi)</strong></td>
<td>− Dry flower buds &lt;br&gt;− Brown blotches on leaves &lt;br&gt;− Buds die off and bend showing a &quot;shepherds crool&quot; formation</td>
<td>− Plant resistant varieties &lt;br&gt;− Use splits from healthy plants &lt;br&gt;− After harvesting, cut back the plants and burn the stalks</td>
</tr>
<tr>
<td><strong>Root rots</strong> &lt;br&gt;<strong>(Fusarium, Rhizoctonia Sclerotonia and Ascochyta sp.)</strong></td>
<td>− Slow wilting and drying of leaves and ultimate death of the plant</td>
<td>− Use splits from healthy plants &lt;br&gt;− Dip splits in fungicides e.g. Ridomil</td>
</tr>
<tr>
<td><strong>Fusarium wilt</strong> &lt;br&gt;<strong>(Rhizoctonia solanum; Sclerotinia sp &amp; Fusarium sp)</strong></td>
<td>− Rapid wilting during dry weather &lt;br&gt;− Wilting and drying of the whole plant</td>
<td>− Crop rotation &lt;br&gt;− Dip splits in fungicide solution e.g. Recoil, Benlate &lt;br&gt;− Use splits from healthy plants</td>
</tr>
</tbody>
</table>

**HARVESTING OF PYRETHRUM FLOWERS**

Pick flowers once in 2-3 weeks when ray florets are horizontal and about 3 rows of disc florets are open. Harvest once the daisies are in full bloom as this is when the concentration of pyrethrins is at its peak. Pick the flowers carefully and hang them in bunches in a warm, airy place to dry. The pyrethrum plant is cultivated for the production of pyrethrins. 92% of all pyrethrins are found in the flowers. The amount of pyrethin concentration in the flower is determined by genotype and the environment (altitude, temperature). Farmers will make the most pyrethrin production by picking flowers at the right time. The flowers develop through 8 stages from the bud to the seed stage. The right stage to pick pyrethrum is when the ray florets are horizontal and the disc florets are open.

The picking interval is between 2-3 weeks and will have attained maximum pyrethrins content. Young immature flowers contain low pyrethrins concentration, which increases from the bud stage up to when its disc florets are open, and then decline gradually. Flower harvesting is selectively done by hand (Fig. ...), and flowers dried and delivered to the factory for processing. The best picking method is by holding the flower between the first and second finger and then pulling the flower head with the thumb.
DRYING PYRETHRUM FLOWERS

Dry in natural sunlight on a raised bed rack or by solar drying to 13% moisture content before transporting to the flower collection centers.
Solar drier for pyrethrum flowers for smallholders - demo

MAJOR STRATEGIES

- Inadequate planting material, former PBK’s nurseries and plant propagation sites that have been unable to produce the required material on time.

- Low flower production, explained by delayed payment to growers and poor extension services. As a result, some growers have neglected their crop while others have switched to alternative enterprises. Farmers’ payments are tied to improved pyrethrum production and sales.
FLOWER AGGREGATION AND PROCESSING

The dry flowers are taken to various designated collection centers in the various growing areas. On delivery farmers are paid an advance of 100/- per every kg, later final payment is done after determination of pyrethrin content at the factory in Nakuru through ……vouchers.

Pyrethrum collection centre

There are two extraction plants at the PRA. Currently the plant that is in operation has a capacity of 25MT per day. The new plant, which has capacity of 50MT per day has not been commissioned because of low flower production and deliveries, and some aspects that are not complete. For test run, the plant requires 350MT of flowers and for it to be commissioned it has to run for 30 days at full capacity. The new plant is more efficient and cost effective since it requires only 15 litres of hexane per tonne of flowers down from the current 250 litres per tonne of flowers being experienced with old plant. To ensure the viability of the processing company it is imperative that sufficient flowers are produced to utilize the installed capacity of the factory. Currently, the country is estimated to produce between 2000-3000 MT per year of dried pyrethrum flower against an estimated potential of 20,000 MT.
The major problem in processing remains the inadequate flower deliveries to ensure optimum operation of the old plant and commissioning of the new one. Whereas the Extraction Efficiency of 87% and Refiner Efficiency of 95% attained are within acceptable range for the plant, the overall processing efficiency of 55% (ratio of Pys in refined extract to that in dry flowers) is very low compared to the recommended minimum of 74%. This is attributed to long storage of dry flowers at the factory while waiting for processing.

The determination of moisture in pyrethrum flowers is carried out by distillation and vacuum methods where the distillation method is superior to the latter because the desiccant used in the latter method absorbed volatile oils as well as the water. The drying temperature also affected the pyrethrin content and varied with clones. Crush the dried pyrethrum flowers to a fine powder in a mortar and pestle or use a blender. For the best results, use the powder immediately after grinding, as the active ingredients deteriorate very quickly.

**PYRETHRUM MARKETING.**

Pyrethrum is marketed through the Pyrethrum Board of Kenya (PBK). The produce is collected by the aggregators at collection centers, Cooperative societies or individual farmers. The dry flowers are transported using pick-ups or lorries by the PRA field officers to the processing factory where the deliveries are weighed and pyrethrin content determined before processing for each individual grower, cooperative society of marketing agents.

[The dry flowers are Sold to Pyrethrum Board of Kenya (PBK) through farmer Co-operative Societies and flower collection centres with the support of the PRA extension officers]

Advance payment of Ksh. 100 per kg on delivery and the new producer price range of Ksh. 100 to 375 per kg based on pyrethrins content were a major attraction of farmers to return to
pyrethrum growing. The farmers were also issued with stockholder certificates for ownership of PBK, which boosted their interest in the crop.

Farmers’ return to growing pyrethrum has been attracted by issuance of ownership stockholder certificates and payments for dry flowers at the new producer price range of Ksh. 100 to 375 per kg based on pyrethrins content; whereby the farmer is paid Kshs 100 per every kg of dry flowers on delivery and thereafter a second payment after determination of the pyrethrin content.

There has been an increase of pyrethrins content in dry flowers from 1.4 to 1.5% in the last one year alone. The projected national average is 1.7% by 2014/15 which is achievable given efforts from PBK management and farmers. The PBK factory adds value to pyrethrins from 1.4% in flowers to over 50% in the refined product.

The refined product, pale extract, is the current cash cow for PBK. It has a range of market segments in the Americas (52%), Europe (35%), Austria & Asia (8%) and Africa (5%). One kg of the product sells at US$ 270 and due to the high demand, the customers always desire to pay up-front once processing is assured. PBK has also diversified its value chain by formulating insecticides. To date, six end use products have been registered, one of which gives a profit of Ksh 22,000 per kg compared to Ksh. 3,000 per kg profit margin from the refined product.

For every processing of 100 MT of flowers, 1.65 MT of the refined product is produced; refined product, known as pale extract which is mainly exported (80%) and remaining 20% sold to formulators for value addition.

There are three (3) levels of Product Portfolio:

**Technical Products**

- Pyrethrum Powder 1.3% w/w AOAC
- Pyrethrum Grist
- Pyrethrum Extract Crude Oleo-Resin 25% w/w PBK
- **Pyrethrum Extract Pale**  25% w/w, **50% w/w, 50% w/w AOAC** pharma, and Conc. w/w AOAC – for export market
By-Products

- Vegetable Waxy Resins (V.W.R.)
- Green oils
- Pyrethrum Fine & Coarse Mark (Py-Mack, is a by-product of the pyrethrins manufacturing industry, and is used as cattle feed. Most of the pyrethrins have been extracted, but enough remains that py-mack can be used as cutworm bait, and in treating early attacks of maize stalkborer. Feeding livestock py-mack is also said to reduce incidence of intestinal worms.)

End-Use Products (insecticides)//Formulations awaiting commercialization

- Pyagro 4EC – Crop protection product
- Pydust 1% - Grain storage product
- Pymos 0.6EC – Adult Mosquito product
- Pylarvex 0.5EC – Larvae stage mosquito product
- Pynet 5EC – Net treatment product
- Pytix 4% - Tick control product.

After value addition the above 3 categories of products confirms that pyrethrum fits well in the economic pillar of vision 2030 as the crop can be converted into a myriad of value added products. **Thus, every single product derived from pyrethrum becomes a raw material for other products.**

OTHER PYRETHRUM PRODUCTS

In addition final product, none of the myriad by-products from the factory is a waste material. For example, Pymarc by-product is sold at Ksh.1,250 per 50 kg bag while sludge is sold at Ksh.50 per kg. In a nutshell one processing of 100 metric tonnes of flowers earns PBK over Ksh. 46 million.

The Pyrethrum industry previously relied on the international market that could only absorb 8000MT of Kenya’s pyrethrum against estimated potential production of 20,000 MT per year. For the industry to maintain its market share in the international market, there is need to put in place strategies for sustainable supply of raw materials.

Additionally, there is also need to exploit the potential that exists in the local and regional market in order to market what the international market cannot absorb. There exists huge
potential in the local market for natural pyrethrum products. For instance, the horticulture industry must meet the requirements for minimum chemical residue levels for products exported to the European market. Availability of a natural insecticide would greatly reduce this burden for the industry.

VALUE ADDITION

PBK further formulated and registered 6 insecticides (awaiting commercialization) for use in public health and sanitation, animal industry and crop protection sub-sectors in an effort to diversify revenue sources and replace Pale by end use products as PBK’s cash cow. However, they are only available at PBK’s shop at the Head Office, Nakuru due to limited production.

These end use products are more profitable than Pale with Pymos (TM) 0.6EC giving a gross margin of Ksh. 22,000 per kg compared with Ksh. 2,600 per kg from Pale. The current production of the pyrethrum extracts is inadequate for the Board to venture into mass production of these insecticides.

Being a manufacturing business entity, Pyrethrum Board of Kenya procures raw material (pyrethrum flowers) from grower, processes into extract which is then sold to the customers.

Product lines contribution and performance

i. Extract (Pale)
   This is the major product which, accounts for 96% of the business revenue.

ii. Pymarc
   Used for animal feeds and accounts for 3% of the sales revenue.

iii. Value added products (End-use products)

   There are five end use products developed from value addition whose profitability in relation to the extract (pale) is tenfold. It is currently accounting for 1% of the revenue earned as it is still under market development process.

Traditional markets for pale have remained the same now at the following levels: Americas (20%), Europe (42%), Australia/Asia (21%), Kenya (10%) and rest of Africa (7%).

Issues or challenges in Pyrethrum Marketing include:

- continued unreliability in delivery of pyrethrum products;
- price setting – limited supplies works against initiating price negotiations;
- cost of maintaining international registrations at low sales volumes (annual subscription);
- cost of technical representation in international markets, which is a must by consumer country legislations.

The main pesticides formulators in Kenya include Syngenta, BASF, Orion

**Utilization:** Aerosols, agricultural sprays, livestock sprays, powder dusts, mosquito coils, pymarc (animal feed)

**POLICIES**

**Current Policy and Legal Frameworks Governing the Industry**

From 1938, the pyrethrum Industry was governed by the Pyrethrum Amendment Ordinance of 1938 which created the Pyrethrum Board of Kenya. This was amended in 1964 through the enactment of the Pyrethrum Act CAP 340 of 1964 which established the Pyrethrum Board of Kenya and the Pyrethrum Marketing Board (PMB). These were later merged through an amendment in 1977 to form one body, PBK. The function of the PBK was to regulate the growing and licensing of pyrethrum in the country. The PBK was also the only body mandated to carry out commercial functions in the industry. In 1963, the PBK in a joint venture with Mitchell Cotts and the Commonwealth Development Corporation established the Pyrethrum Processing Company of Kenya (PPCK). PBK later acquired the shares of the other shareholders and became the sole owner of the PPCK. In 1973, PBK opened a liaison office, the Kenya Pyrethrum Information Centre (KPIC), in Salzburg, Austria, as a requirement to sell in the European market.

In 2013, the Pyrethrum Act CAP 340 was repealed by the Crops Act 2013. On the same day, the Pyrethrum Act no. 22 of 2013 which established the Pyrethrum Regulatory Authority (PRA), was also enacted. The Agriculture, Fisheries and Foods Authority (AFFA) Act, 2013 takes over all the former institutions established under the repealed Acts which included the Pyrethrum Board of Kenya. This situation where two regulatory bodies (AFFA and PRA) have been provided for by the law to govern an industry creates confusion and inconsistencies.

Currently, there are proposed amendments which seek to reinstate PBK as a regulator under AFFA and have the commercial functions transferred to PPCK. The amendments also seek to iron out the inconsistencies between the two legislations. For example, pyrethrum is traded as PBK, which is a trade mark for PBK’s produce and products. This has not been taken into account in the Pyrethrum Act no. 22 of 2013. The Act also does not indicate what
happens after the interim period of three years when PRA will continue to perform the commercial and regulatory functions in the industry.

The functions that are currently being carried out by the PRA (formerly PBK), can be classified as either regulatory or commercial as follows:

**Functions of regulatory and commercial entities**

**Regulatory issues**

a. Licensing of:
   i. Commercial nursery operators
   ii. Processors
   iii. Formulators

b. Standards setting and quality control for nurseries and processed products

c. Statistics
   i. Register farmers for traceability
   ii. Collect production and processing statistics
   iii. Assist commercial companies with these statistics for export purposes

d. Management of Pyrethrum Development Fund

e. Formulation of Policies guiding the industry

**Commercial entity**

i. Promotion of flower production
ii. Production of Flowers
iii. Purchase of flowers from farmers
iv. Processing of pyrethrum flower
v. Value addition
vi. Market pyrethrum and pyrethrum products
vii. Warehousing
SERVICE PROVIDERS

1. Research:
   i. KALRO / Molo Research Station and
   ii. Pyrethrum Board of Kenya currently Pyrethrum regulatory Authority

2. Commercial Nursery Operators
   i. Pyrethrum Regulatory Authority (PRA) - farms
   ii. Senju International Ltd
   iii. Highchem Agriculture Ltd
       Others include self help groups, Farmers cooperative societies (FCS), individual farmers, ..

3. Transporters: PRA, County governments, Agricultural projects –KAPAP

4. Processors: PRA at Nakuru, Others include –
   i. Botanical Extract (EA) Ltd
   ii. Marie Papo Co. Ltd

5. Formulators: PRA and Individual companies
   i. KAPI Ltd
   ii. Orion
   iii. Bayer
   iv. KEBS

6. Traders/Stockists/ other input suppliers

7. Extension providers:
   PRA, County Government,