WEED CONTROL in Coconut Lands

Various plants that grow other than the groups which are being selectively cultivated are termed as weeds. The weeds compete with the coconut palm for nutrients and moisture. Creepers like *Micania* blocks sunlight when they wind completely over coconut seedlings. In addition weeds such as Mimosa and Illuk obstruct usual eatate practices like manuring and picking. Use of deep tillage and mammoty weeding increase operational costs. All these combined attempts will ultimately result in decreasing returns, the cause being weeds. Such hindrances have necessitated planned weed control in coconut estates.

On the otherhand weeds are advantageous as they prevent surface runoff, and reduce damagas tc soil due to direct exporsure to sunlighl. they are also a source of organic manure and cattle feed.

While complete irradication of weeds (as in vegetable gardens) in coconut lands is inadvisable, it sounds resonable to check growth of only the very noxious weeds.

Weed control measures can be classified under (1) Mechanical, (2) Cultural (3) Chemical and (4) Biological.

Mammoty weeding, tilling harrowing, slashing with "Visikaththies" and machines are modes of mechanical control of weeds. Intercropping, raating of cattle, systematic coconut planting, establishment of covercrops, mulching and prevention of invading weed seeds dispersed by wind and water are all examples of cultural control of weeds. While recommended weedicides are applied in chemical control, in the science of weed control by biological means, predatory insects, parasitic fungi, bacteria and viruses are said to be employed. Various techniques of weed control are adopted in different coconut lands.

The regions that border Galewela, Chilaw, Kalutara in the coconut trangle, and the others that also border the coconut trangle, the East Coast Rehabilitation area, together, are considered coconut growing areas. Here again this cocoonut triangle is divided into Wet (Gampaha, Mirigama) Intermediate (Lunuwila, Kurunegala) and Dry (Puttalam, Nikaweratiya) zones.

The weeds present are specticular to each region· In addition, the soil types, situation and estate management levels also determine the type of weed. The most suited methods of weed control in coconut lands are those of mechanical and cultural, while control of weeds by biological means is yet in the experimental stages. The Coconut Research Institute has obtained satisfactory results in biocontrol of *chromolaena* (Podisinghomarang) with an insect defoliator called *Parechaetes pseudoinsulata*. Although chemical control of weeds tend to increase coconut yields as experimented in other countries, the sums of money involved in purchase and application of weedicides are not cost benefitting

For reasons explained, chemical control of weeds may be suitable only against very noxious weeds such as Illuk, in coconut nurseries, intercropping lands with pineapple, etc. and also in large estates when shortages of manual labour is experienced.

Mechanical control of weeds by slashing and mammoty weeding would ideally suit the small holder. Likewise weed control using machinery and tillage impliments do suit large estate owners. While in the process of attempting weed control, it is felt unwise and unsuitable to completely uproot tall plants that are unwanted. For example total irradication of Mimosa results in the exposure of soil and consequently noxious weeds like "Podisinghomarang," Foxtailgrass etc. which propagate by seeds may get newly established in such lands. Tilling and harrowing could also yield similar results. It will be an asset for a grower to acquaint himself with seasonal behaviour and weed dispersal. Slashing is the most suitable method of keeping weeds under control. It is so because successive slashing of weeds like "Podisinghomarang," "Cida", "Gatakola" (all of which are seed producing) reduce growth and eventually disappear enabling beneficial types of grasses, "Undupiyaliya" and "Aswenna" to appear. Such practices promote weed free environments in coconut lands for considerable periods of time.

The cultural methods practised in checking weed growth can be applied in both small and large coconut plantations, as mentioned

(1) Proper maintenance of the plantation

Illuk, Foxtail grass, Podishinghomarang are congenial to sunlight. Therefore they grow mostly in neglected or barren lands, or in lands where under planting has been delayed. Good management and adherence to specified planting distances should assist in suppressing such thick weedy growth.

(2) Cover crop

Weed growth can easily be kept under ckeck with the establishment of nodular cover crops, such as *Calaphogonium, Centrosema* and *Pura-rai*. The Coconut Cultivation Board grants Rs. 1000/- per acre for such ventures. Cover crops also enrich the soil and conserve soil moisture and in addition keep the weed growth under control.

(3) Intercropping

Intercropping of a coconut land with selected crops as recommended by Coconut Research Institute is an excellent, weed control technique. This is low costing, as the land will have to be weeded prior to intercropping. Planting of pineapple, passion fruits and manioc necessitate weeding essentially, while intercrops like coffee and cocoa induce natural check in weed growth as they provide sufficient shade by covering ground surface. Lands that are left neglected especially after pineapple harvests give rise to thick flushes of weeds and therefore systematic maintenance is an essential requirement in intercropping of lands.

(4) Grazing

This is a less troublesome and a profitable venture. The fresh leaf blades that flush out after slashing illuk can be kept under satisfactory control by allowing buffaloes to graze. But the foliage of young coconut palms should be kept out of their reach. This being a popular practice in small holdings has the added advantage of obtaining sufficient quantities of cowdung. But the disadvantage here will be the tendency of some weeds like "Podisinghomarang," "Babila", and "Apala" to flare up and which are of course unpalatable to cattle.

Excessive grazing may cause the destruction of beneficial plants and exposing the soil thereby. This encourges the extensive weed growth through seed propagation. It is very essential to see that cattle grazzing is limited proportionately and systematically or otheswise pasture should be grown in accordance with relevant Coconut Research Institute recommendations.

(5) Mulching

Covering the soil is a method adopted in many developed countries. In our country, after manuring the circles can be covered with coconut fronds, husks and slashed weeds etc. to avoid rapid weed growth around palms. These tends to be a few practical problems if coconut husks are utilized for mulching. Fibre dust is not a suitable mulching material.

(6) Avoiding the Spread of weeds from external sources.

Many coconut nurseries harbour abundant weeds like Atawara. These weeds invade lands through seedlings transported from such nurseries. As a preventive measure always obtain good seedlings. It is necessary to clear weeds along road edges bordering your land, and also to prevent seed dispersing weeds like foxtail grass from invading your land.

In the Eastern Province along the sea cost, and in Puttalam District setting fire to weeds is generally done in dry spells. But it must be stressed that burning not only affects coconut palms but also destroys a fair amount of organics as well. Illuk apparently flushes much better a few weeks after burning. Therefore attempts to control weed growth by burning are very inadvisable.

Only cuttings and seed bearing portions of weeds which tend to propagate even after uprooting should be heaped up and burnt in a suitable site.

If on the basis of this article you are still confronted with any weed problem please contact the Coconut Research Institute for advice.

We list below a few major weeds well distributed in all coconut growing areas of Sri Lanka. Weed development modes of spread and main control techniques are also described. Establishment of cover crops and intercrops are too common practices applicable for the effective control of such weeds.

By
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Local and Botanical Names of Weed	*Wide distribution in coconut growing areas*	*Propagation and dispersal*	*Easy methods of control*
(a) Dicots			
1. Podicinghomarang *Chromolaena odorata*	Wet and Intermediate zones in the Coconut triangle. (Gampaha, Divulapitiya, Mirigama, Narammala and Kurunegala)	Annual-Reaches 6-7 feet in height. Flowers in December-January. Seed dispersal by wind.	Mammoty weeding, uprooting and burning before flowering. Slashing before maturity.
2. Nidikumba *Mimosa pudica*	Wet and intermediate zones in Coconut triangle	Annual. Throns present. Estate management hindered.	Digging and burning. Exposed ground surface be utilized by intercropping. Slashing or harrowing during tender stages.
3. Kesel paluvel/Wathupalu *Micania Scandens*	Wet and Intermediate zones in coconut triangle	Creepers. Grow twining round coconut palms. Induce unnecessary basal root formation by covering base of palm. Propagation seed and vegetative	Allowing cattle to graze. Mammoty weeding or successive slashing.
4. Babila Three species. 1. *Sida rombefolia* 2. *Sida acuta* 3. *Sida cordifoliya*	Wet and intermediate zones in Coconut triangle	Tiny hardy plant. Yellow flowers. Seed dispersal. Multiplies when grazing is excessive.	Slashing, Mammoty weeding and harrowing. Preventing excessive grazing.
5. Apala *Urena lobata*	Wet and Intermediate zones in coconut triangle (specially Gampaha, Divulapitiya, Mirigama)	Grows about 3 ft high hardy bushy plant. Dispersal like Babila. Seeds stick on to animals for dispersal.	Especially as for Babila.

Local and Botanical Names of Weed	Wide distribution in coconut growing areas	Propagation and dispersal	Easy methods of control
6. Tora Two species 1. Pethi tora *Cassia tora* 2. Pathi tora *Cassia occidentalis*	Wet and Intermediate zones in coconut triangle (Especially Gampaha, Divulapitiya, Mirigama, Narammala)	Grows about 2 ft high. Dry bushy plant. Seed propagation. Seeds in pods	Slashing and mammoty weeding. Harrowing. Grazing in tender stages.
7. Pila *Teptrosia purpurea*	Intermediate and Dry zones in coconut triangle (Especially Puttalam, Kalpitiya, Mulidel and some regions in Kurunegala District)	Grows about 2 ft high, spreading branches. Flowers purple pink. Seed propagation. Seeds in pods	Can be utilized as a green manure. If control is desired harrowing, mammoty weeding or slashing are suitable.
8. Getakola *Hedyotis auricularia*	Wet zones in coconut trangle (Divulapiiiya, Mirigama, Gampaha, and Giriulla regions)	Creepers. Seed propagation. Lands kept negelected after pineapple, Manioc harvests, unnecessary tilling or harrowing, excessive grazing are contributory factors.	Creepers dry up during Jan. March dry spells. Suitable to slash or harrow with May rains.
9. Yakwanassa *Anisomeles indica*	Entire regions of the coconut triangle (especially in Kuliyapitiya, Narammala, Puttalam, Madampe, Kurunegala)	Grows or in bushes. Producesti y violet flowers. Seeds produced in colustors. Repulsive smell. Seed dispersal-expedited as in Getakola.	As for Getakola.
10. Gas nerenchi *Acanthus permum hispidium*	Intermediate and Dry zones in coconut trangle (Puttalam, Madampe, Chilaw, Batticaloa, Kalkudah and Nikaworatiya in Kurunegala District)	Bushy and surface ramifying. Produces yellow flowers. Seed propagation adopted as in Getakola.	Slashing, harrowing, Mammoty weeding and burning. Cattle grazzing to be controlled.
11. Kurunegala Daisya *Tridax procumbens*	Kurunegala and suburbs.	Annual. Flowers yellow seed propagation Jan.-Feb.	Mammoty weeding before flowering slashing and harrowing.
12. Karalhaba *Achyranthes aspera*	Intermediate zone in coconut triangle. (Lunuwila, Kuliyapitiya, Wariyapola, Kurunegala)	Grows about 2ft high. Sticky seeds present on upper twigs. Seeds propagation-quick disposal adopted as in Getakola.	Control methods as for **Neranchi**

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13. Balunakuta *Stachytarpheta indica*	Wet zones in the coconut triangle (Gampaha, Mirigama, Divulapitiya, Giriulla)	A bush grows 3-4 ft high. Flowers tihy violet, leaves tee-thed and opposite. Seed propagation Disposal adopted as in **Getakola**.	Slashing-Digging uprooting and burning bushes. Harrowing.
14. Getatumba *Leucas zeylanica*	Above regions	Grows 2 ft high. Flowers in vegitative axis. Seed propagation. Dispcsal adopted as in **Getakola**	Slashing, Mammoty weeding and harrowing
15. Madurutala *Ocimum sanctum*	Intermediate and Dry zones in coconut triangle , East Coast. (Puttalam, Mundel, Chilaw, Nikaweratiya and and Wariyapola)	Grow 1 1/2-2 ft high. Flowers on stem. Repulsive smell. Seed propagation. Fast disposal adopted as in Getakola.	As described against **Getatumba**
16. Ganhandu	Lunuwila, Divulapitiya, Madampe, Chilaw, Kuliyapitiya, Kurunegala	Grows to about 1 foot high, branching. Their ends bear white flowers in spadix. Mature leaves turn golden. Stem and leaves hairy. Seed propagation. Neglect and excessive sunlight increase growth.	Slashing and harrowing
17. Pinna *Clerodendron infortunatum*	Wet zones in coconut triangle, lands with good moisture levels. (Gampaha, Mirigama, Divulapitiya)	Grows 3-4 ft high. Produces red flowers. Propagation by seeds and root cutting.	Mammoty weeding and slashing
Grasses 18. Illuk *Imperata cylindrica*	Intermediate and dry regions in the coconut triangle (Puttalam, Mundel, Madurankuliya, Chilaw, Nikaweratiya, Wariyapola) East Cost Rehabilitation area Kalkudha, Batticaloa.	Grows year round. About 3 ft high. Flowers silver white. 3-8 inches long. Roots dense. Propagation by wind dispersal of seeds, and by underground root stems.	Control methods difficult. For mall holders:- digging out of underground roots, drying and burning, and intercropping with sweet potato and Manioc are advisable. Allowing buffaloes to graze on tender illuk blades successively is suitable.

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19. Rilatana *Pennisitium polistachion*	All coconut growing areas. (Especially in Divulapitiya, Mirigama, Gampaha, Horana, Chilaw, Galewela regions)	Bushes grow 7-8 ft high. Yellow flowers produced in 6-8 months. Generally Nov-Dec. is the flowering season. Propagation by seed and root cuttings. Utter neglect, ploughing during seed disposal periods, excessive grazing, too much exposure to sunlight are some causative factors.	Slashing in the tender stages. Uprooting and burning. Grazing. Harrowing encourges spread.
20. Tuththiri Heen Tuththiri *Chrysopogon aciculatus* Ath tuthithiri *Aristida setacea*	All coconut growing regions-especially in Naramala, Kuliyapitiya, Divulapitiya S.P. and Mundel	Athtuththiri grows taller (4-5 high) Bushy. Annual spreading. Similar to Rilatana. Sticky seeds on animals cause their dispersal.	Being fast growing bushes they should be uprooted and burnt. Slashing can be done for control both types. Grazing can be done during tender stages.
21. Atora/Atawara *Panicum repens*	Intermediate and Dry zones in coconut trangle. Areas around East Cost Coconut Rehabilitation project.	Consists of under ground wolen roots (rhizomes). Propagation by seeds and root cuttings.	Difficult to control underground rizomes should be uprooted dried and burnt. This is effective although expensive. Repeated slashings. Grazing harrowing are suitable. Weedicides like Roundup and Dalapon can be applied in coconut nurseries.
22. Kukul atawara *Cynodon dactylon*	Distributed in all coconut growing areas.	Smaller in size compared to Atora. Grows year round. Propagation by seeds and rizome cuttings.	Control methods as for Atora
23. Kuweni *Centuras echinatus* Ferns	Intermediate and Dry zones in the coconut triangle	Annual grass. Flowering. Seeds posses spines. Propagation by seeds and leaf blades.	Sashing and harrowing Gazing before flowering.
24. Kekilla *Glachenia litteris*	Low yielding coconut lands with poor drainage low lying areas of Katunayake and Southern Province.	Seeds and flowers not produced. Propagation by under ground rhizomes.	Mammoty digging or sashing.

* Commonly used local tergs differ according to the region and location of the plant.