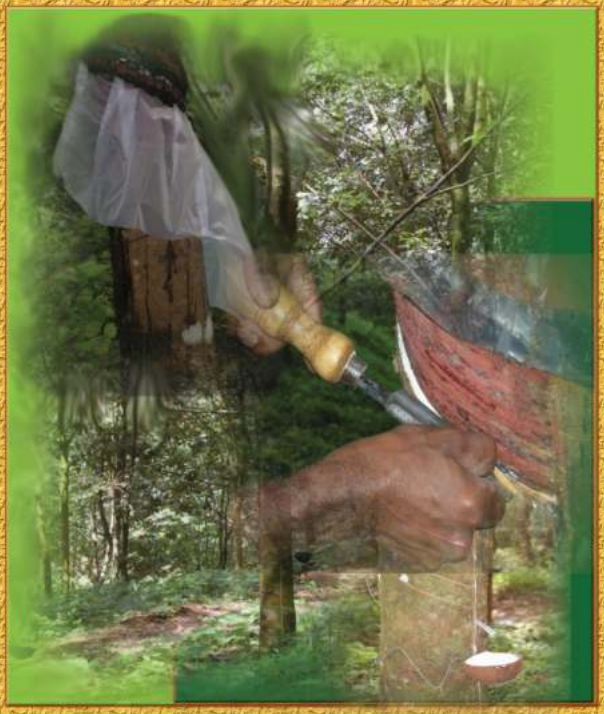
Advisory Circular No.2016/03

Tapping and Use of Rainguards



Rubber Research Institute
of Sri Lanka

Correct Tapping Recommendation

How to determine the suitability of new rubber clearing for tapping?

- 70% of the trees should have a girth of 50 cm or above measured at 120 cm from the highest point of the grafted union (Fig. 1).
- In such a clearing, all trees having a girth not less than 45 cm can be tapped.

Marking a tree for tapping

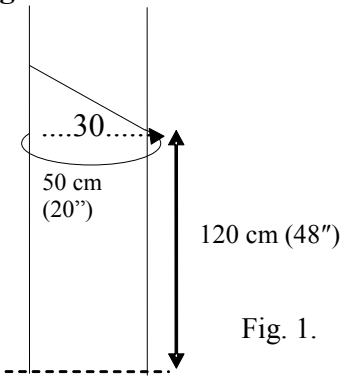


Fig. 1.

- Height of opening - the lower end of the tapping cut should be at 120 cm from the highest point of the grafted union (Fig. 1).
- Tapping panels are to be marked by dividing the trunk into 2 equal halves (to east and west if convenient to the tapper) with vertical grooves ("*Netthikanu*" and "*Poikanu*")
- Tapping is done only in one half (one panel) of the tree (Fig. 2).
- Tapping angle should be 30^{o} to the horizontal plain (Fig. 1 & 2).
- Tapping system depends on the clone (Table 1). Annual bark consumption varies with tapping system.
- Annual bark consumption and tapping angle should be marked on the tree using an appropriate stencil (Fig. 2).
- Drawing lines 4" apart and parallel to the wooden handle on the stencil (Fig.2), helps to place the stencil correctly prior to drawing the guidelines.

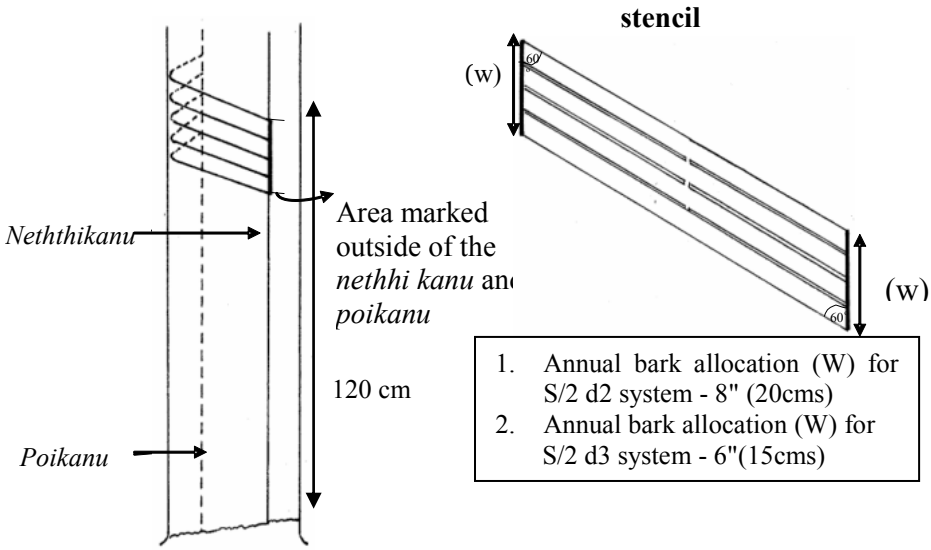


Fig. 2. Marking of the tapping cut

Golden rules in tapping

- Thickness of a shaving should be 0.125cm (thickness of a finger nail).
- Cambium should not be damaged during tapping.
- A good quality knife should be used to facilitate correct tapping. Tapping knife has been improved recently to achieve quality tapping.
- In a new clearing, tapping should be commenced during the dry spell after NE monsoon.
- A rubber tree should be tapped for a minimum period of 24 years by tapping each panel for 6 years.
- Tapping of renewed bark has to be commenced from the initial height of opening and the panel should be renewed for 12 years.
- No double or recovery tapping should be done during the first three years of tapping.
- In the case of double or recovery tapping, maximum of two per week and 6 per month should be allowed. Also, dry and wintering periods should be avoided and a minimum of two normal tappings should be placed in between two recovery tappings.

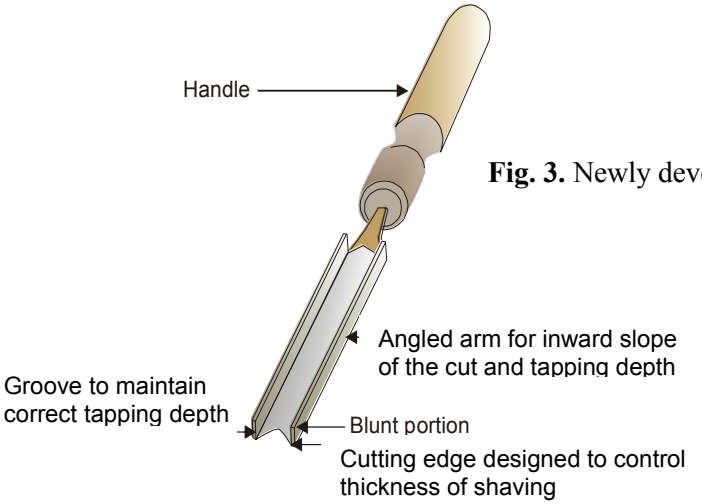


Fig. 3. Newly developed tapping knife

Recommended tapping systems for different clones

Table 1. *Tapping systems recommended (from commencement until intensification) for different clones*

Clone	Tapping systems
RRIC 100, RRIC 102, RRIC 121, RRIC 117, RRIC 131, RRIC133, GPS I, RRIM 712, BPM 24, PR 255, PR 305, PB 255 and all RRISL clones (except RRISL 217)	Half spiral tapping, once in two days. **(S/2 d2)** from the commencement of tapping to intensification (for 18 years).
PB 28/59, PB 217, PB 235, PB 260, RRII 105, RRIC 130, RRISL 217	Half spiral tapping, once in three days **(S/2 d3)** from the commencement of tapping to intensification (for 18 years).

Intensification in tapping

Why tapping should be intensified?
To obtain maximum possible latex yield during the last six years of tapping (before uprooting) with systematic and efficient utilization of the bark.

Method of intensification

- During first three years of intensification (19th to 21st years of tapping), in addition to panel D (BI-2), an upward quarter cut is made on the opposite higher panel (HO-1). Each upward quarter cut should be tapped only for 1½ years under d2 system.

- During the 4th and 5th years (22nd & 23rd years of tapping) upward and downward half spiral cuts are also made on opposite panels along with what has been tapped during the first three years.
- During the last year (24th year of tapping) a total of 4 half spiral cuts, two tapped upwards and two tapped downwards on opposite panels.
- Tapping angle for higher panels in 45^0. For d2 frequency of tapping bark allocation is 25 cm in the first year. Bark allocation could be increased in subsequent years.
- The distance between an upward and a downward cut should be greater than 50 cm.

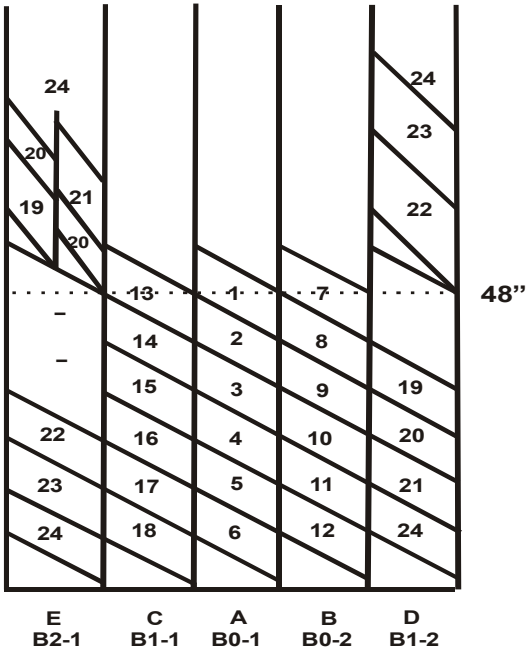


Fig. 4. Schematic diagram showing the panels during the intensification

Table 2. *The scheme of intensification*

Year of intensification		
1st, 2nd and 3rd year	S/2D +S/4U d2	- 150%
4th and 5th year	2 x S/2 DU d2	- 200%
6th year (final)	2 x S/2D d2 + 2 S/2 U d2	- 400%

Low frequency tapping (LFT) as a method of minimizing both labour requirement and tapping cost

Instead of alternate day tapping, the frequency of tapping is reduced to once in three days or four days with the use of yield stimulants (Ethephon Ethrel) in this system. Ultimate yield per tree per year will remain the same. The bark consumption rate is less in LFT systems resulting in an extended tapping cycle. This system can be applied to clones which are recommended to tap under d2 system.

Method of application of stimulant

- Apply 2.5 cm band of 2.5% Ethephon 0.5cm above the tapping cut and on the entire length. Number of applications of stimulant should be 4-5 rounds per year for d3 frequency and 9 rounds per year for d4 frequency. If Ethephon of a higher concentration is used, it should be diluted to 2.5% with warm water (*ca.* 50 ^{o}C)

- The cork of the bark should be scraped if application is done below the tapping cut (when the panel is badly damaged).

- A brush made out of coconut husk ¾″ x ½″ is suitable for application of stimulant (Dip ½ an inch of the brush in the stimulant solution twice and apply on the tapping cut avoiding the tree lace (Fig. 5). Whilst the quantity of stimulant a tree will receive will depend on the girth; an average tree would get about 1.6 g (1.5 ml). To get maximum result tapping should be done 48 hours after stimulation.

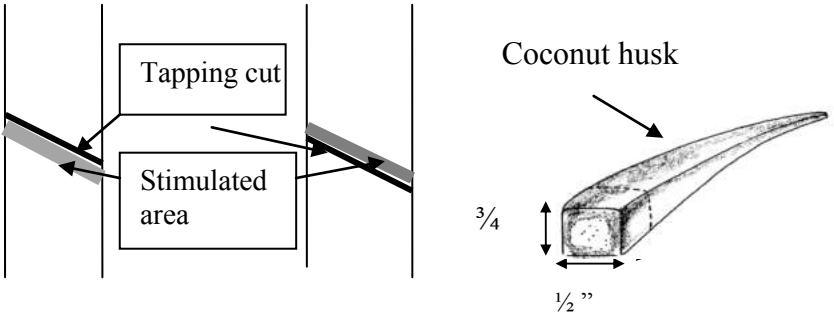


Fig. 5. Schematic diagram showing the area to be applied with stimulant

Control Upward Tapping (CUT)

Why CUT is useful

- To allow more time to BI-2 panel (D) to renew more time when virgin panels have been consumed earlier than recommended.
- To utilize high panels effectively and to obtain an optimum yields.
- Extend the replanting cycle by delaying intensified tapping (additional 4 years can be tapped using this method).

Method of introducing CUT (Fig. 6)

- Commence just after the completion of BI-1 (C) panel and before intensification.
- ¼ spiral upward cuts are introduced above the renewed bark (BI-2) during first two years.
- The 1st quarter panel (1 of the Fig. 6) should be attached to Poikanu.
- In 3rd and 4th years, virgin bark above the BII-1 panel is tapped. However, the panels should be changed every 3 months.
- Being an upward cut, tapping angle should be maintained at 45°.
- In order to avoid any waste of bark, all upward cuts should be commenced at the same height where lower cuts had been introduced (Fig. 6).
- 5% Ethephon is to be applied monthly and tapping frequency should be d3. Rainguards have to be used to get an optimum yield for a longer period. Stimulants can be applied just below the tapping cut without removing the lace.

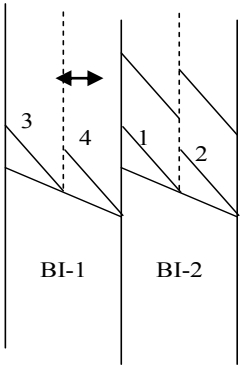


Fig. 6. Panel and bark allocation for CUT

Practical means to avoid rain interference on tapping: Rainguards

- Use of rainguards will significantly lower the tapping days lost due to rain interferes.
- Annual income of both land owners and LEOs will increase by about 40%
- With the use of rainguards, the recommended tapping system should be adopted. Daily tapping should be avoided.
- The lifespan of a rainguard is one year
- 6-8 days of additional tapping is sufficient to cover the cost of the rainguard.

Types of rainguards

1. Apron type (Figure 7)
2. Kissan type (Figure 8)

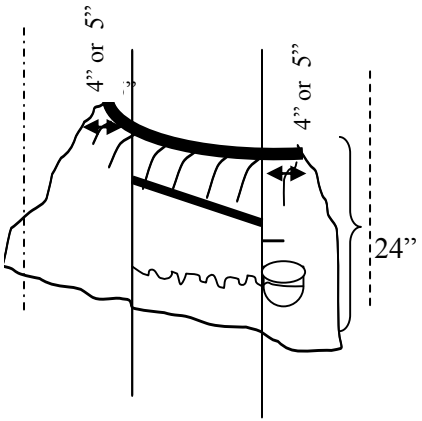


Figure 7.

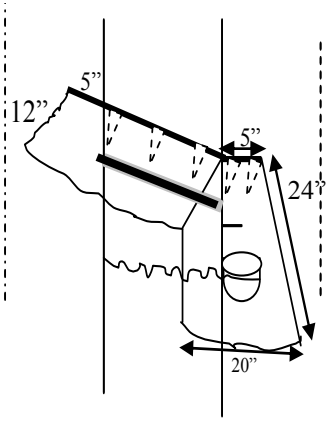


Figure 8.

Types of rainguard sealant

- There are two types of sealants, *i.e.* liquid and semi solid.
- Rainguards can be fixed using both types of sealant.
- If the panel is wet due to a leak/s, such trees should not be tapped.

Liquid type

- This should be soft enough to apply with a brush made out of coconut husk.
- It should not melt and seep along the tree trunk.
- Should be able to fix the polythene in a few minutes after the application of the sealant.

Semi solid type

- Should be soft enough to apply with hands (manually).
- The mixture should be like a dough.
- Should not melt and seep along the trunk when exposed to sunlight.

Specifications for the materials other than sealants

Polythene

- For apron type, polythene should be of low density and of gauge 300 (gauge 150 for a single sheet), 60 cm in width and transparent. It should be stitched along one edge keeping ¼ an inch frill for every inch using a sewing machine. One meter comes to 60 cm after frilling (page 14) and 1 kg of polythene is sufficient for 20 trees.

- Cut stitched polythene into 40-45 feet pieces prior to taking into the field in order to minimize wastage caused by differences in the size of trees.

- Kissan type of rainguard can be made with two strips of 500 gauge high density polythene. Recycled polythene is not suitable for this. The diagrams in pages 15 & 16 illustrate the steps to be followed in preparation of it. One kilo of polythene is sufficient for 28 rainguards.

Other items

- Medium size stapler with pins (10 boxes of 24/6 staplers are sufficient for 100 trees).
- 1″ width strip of cotton cloth (when using liquid sealant). One yard of 60″ width cloth is sufficient for 70 trees.
- 500 gauge polythene cut into 2 cm width strips (when using semi solid sealant). One kg of polythene is sufficient for 400 trees.

Steps to be followed in fixing rainguard (General information)

- Bark of the rubber tree should be dry to fix the rain guard.
- Lightly scrape a 5-7 cm strip on the tapping panel parallel to but 10-15 cm above the tapping cut (Fig. 2).
- Scraping should exceed the length of the cut by 15 cm at each end.
- It is advisable to fix rainguards about two days after scraping.
- Clean the bark with a piece of cotton material before fixing rainguards.
- In the case of apron type rainguard, cut the frilled polythene to a length two inches less than the total length of the scraped bark. The cutting edge should be parallel to "*neththi kanu*" and "*poi kanu*" in order to cover the latex cup properly.
- If liquid type of sealant is used, apply a ca. 3-4 cm band of it along the scraped strip of the bark using a brush made out of coconut husk (Fig. 3). (Heat the sealant lightly if it is too hard to apply).
- In the case of semi solid sealant, apply little thick band about 2cm width.
- The top edge of the rainguard is to be placed along the middle of the sealant strip.

- On top of this edge, fix the 2 inch polythene strip (500 gauge) using 6-9 staplers. It is important to extend the polythene strip one inch away from the both side of the rain guard.

- If the liquid sealant is used, a cotton strip is to be used instead of polythene strip.

- Whilst tapping, rainguard is to be lifted. However, it should be put down soon after.

- Regular maintenance should be done as given in the time schedule (page 13).

Preparation of rainguard sealant

- Prepare a barrel as shown in Figure 10. It facilitates ease mixing and minimize the chances to catch fire while heating.
- Get the raw materials in proportions as shown in Table 3.

Table 3. *Quantities of raw materials required to prepare 100 kg of sealant*

Materials	For Liquid type	For Semi Solid type
Tar	67.7kg	58.1kg
China clay powder	22.5kg	29.1kg
Rubber (as field latex)	9kg*	11.6kg*
Sulphur	0.9kg	1.2kg

- Volume of field latex needed will depend on the % dry rubber content of it. 22.5 and 29 litres of 40% DRC latex is needed to obtain 9 and 11.6 kg of rubber.

Steps in sealant preparation

- Add tar into the barrel and heat until it becomes liquid.
- Add latex to the hot mixture little by little.
- Heat the mixture till most of air bubbles disappear.
- Add china clay to the mixture gradually (in 5 aliquots) with continuous stirring. Initially a half and then little by little.
- Once every thing has mixed properly, remove the fire.
- Add sulphur and mix properly.

Storage

Both semi solid and liquid sealants can be stored in tine.

Warning!

Make sure that the flame does not reach to the brim of the container during the entire process of heating. Keep a wet gunny bag to prevent unnecessary fires.

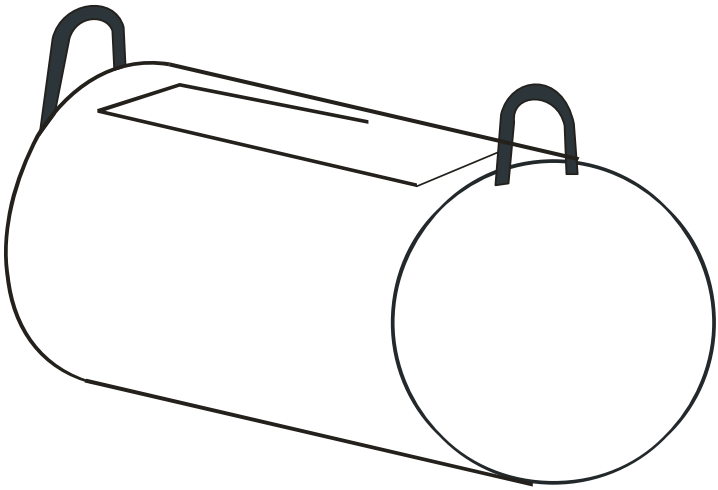


Fig. 10. The barrel used for the preparation of rainguard sealant

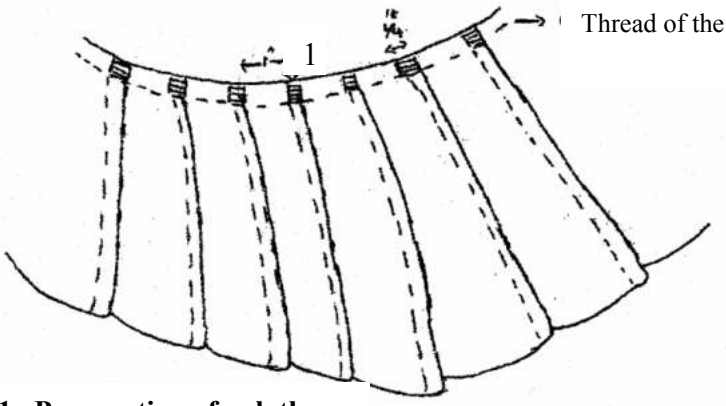
Raw materials required for rainguards can be purchased from the following places at a reasonable cost.

Tar	Sri Lanka Petroleum Corporation (Tel. 0112327076) Mohomed Thaha, No 14, Grand Pass Road, Colombo 14. (Tel.0112321511)
China clay	Ceramic Factory, Piliyandala (Tel. 0112509231). Lanka Minerals and Chemicals, Industrial zone, Avissawella (Tel. 0362231153-4)
Sulphur	Hardware shops for building materials. It is advisable to buy the industrial grade.

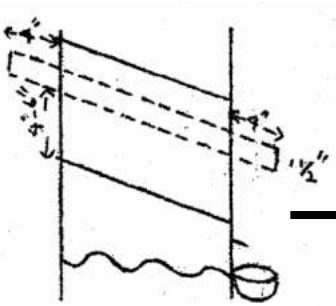
Time table for fixing rainguards

November/ **December**	• Select suitable fields for fixing rainguards (preference should to given to high yielding fields). • Kissan type rainguards are suitable for highly humid fields where sunlight is low. • Count the exact numbers of trees to be fixed with rain guards (dry and very low yielding trees should be avoided). • According to the above count, the requirement of raw materials and the cost should be estimated. • Panel marking is to be undertaken.
January	• Gather the raw materials. • Polythene should be processed (*i.e.* stitching of Apron type rain guards; polythene sealer is required for Kissan type (Fig 2).
February	• Preparation of rainguard sealant. • Awareness programmes to educate the workers to fix rain guards.
March	• Rainguards should be fixed with refoliation and this should be completed before the commencement of South-West monsoon and the New Year holidays.
May and September (Maintenance)	• There may be leaks in both types of rainguards (10-15%). With little sealant, those leaks can be repaired. Therefore, regular inspections are required particularly in these months of high rainfall.

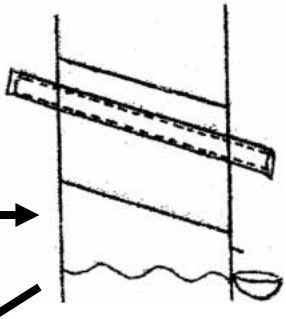
Fixing of Apron type rainguards



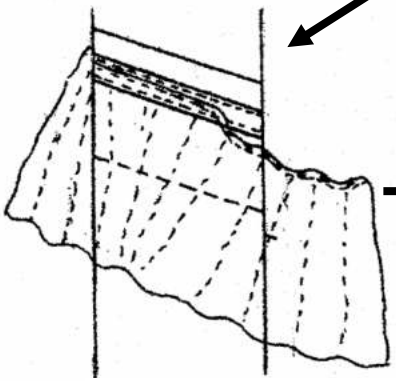
Step 1. Preparation of polythene



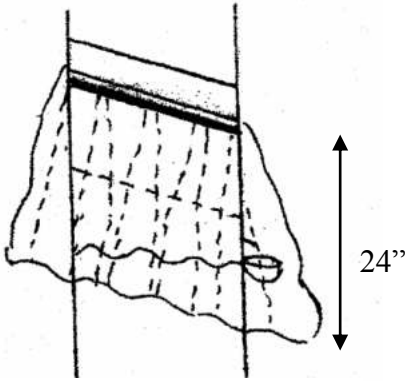
Step 2. Scraping



Step 3. Applying sealant



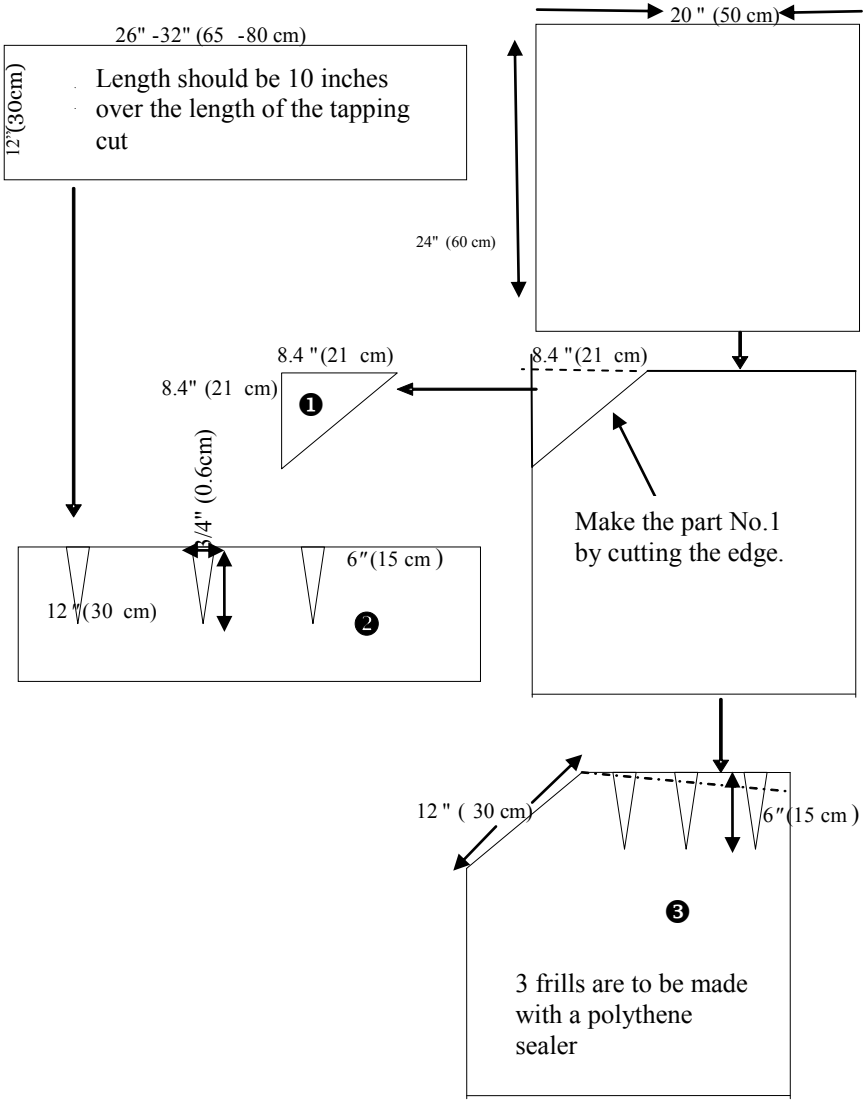
Step 4. Fixing

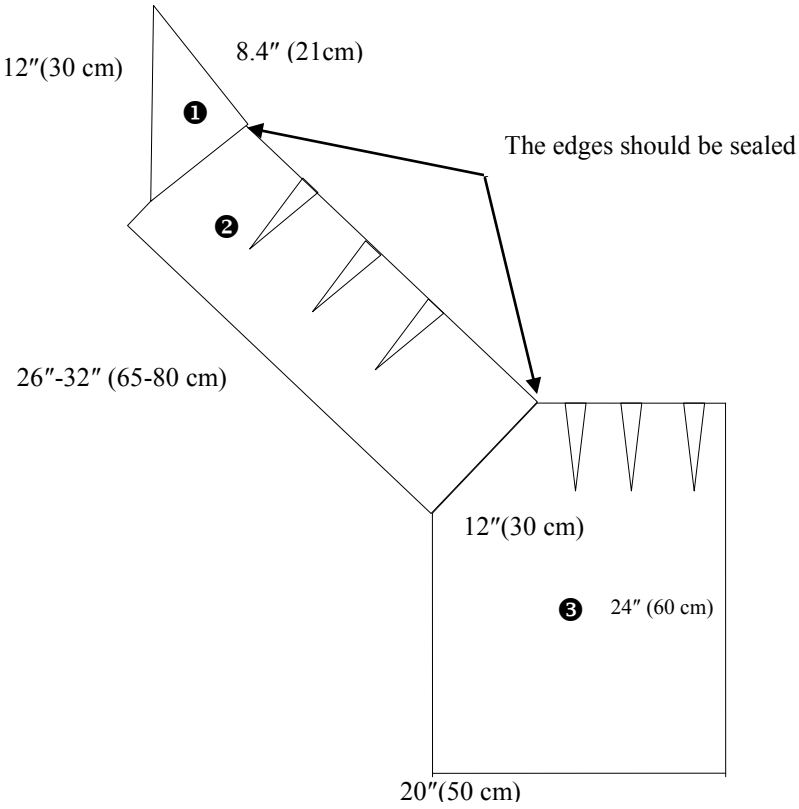


Step 5. Rainguard after fixing

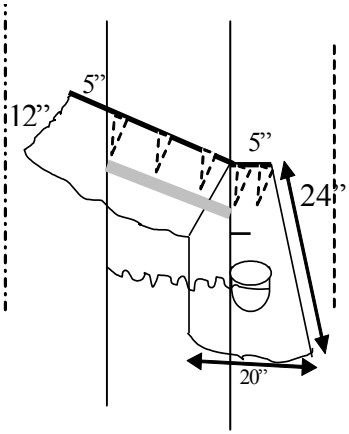
Fixing of Kissan type rainguards

Preparation of polythene





Join the 3 pieces with a polythene sealer



Rainguard after fixing

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