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POLICY PAPER



Managing the bitter chocolate: Chocolate weed management in Onattukara tract of Kerala

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M*elochia corchorifolia*, also known as Chocolate weed or English teaweed is an introduced weed, believed to be a native of Eastern and Southern Africa. It belongs to the family Sterculiaceae. The weed might have spread to southern Asia and then to Australia. It has now attained the status of a pantropical weed and extends all over the tropics. Chocolate weed is a herbaceous shrub with a woody taproot. The stem may be erect or prostrate and is usually red in colour. If left unchecked, they may grow to a height of about 2 meters. The leaves are petiolate, in alternate arrangement having an ovate to lanceolate shape with double dentated serrations on the edges. The flowers are usually small, appear pubescent and are produced in terminal head like cymes. There are five petals in each flower which may be pink to lavender in colour. Chocolate weed, flowers and fruits through-out the year. The seeds are small, brownish to black in colour and are found inside a five valved capsule. Each plant produces hundreds of seeds and this is one reason why the weed is infesting the cultivated areas in many parts of Kerala.

In Onattukara tract of Kerala, where sesame is grown, this weed is emerging as a menace. Onattukara tract of Kerala covers an area of over 600 hectares covering Alappuzha, Pathanamthitta and Kollam districts of Kerala. The soil is loamy sand with a porous nature having low organic matter. One of the main crops grown in Onattukara is sesame. Sesame, which is grown during the rabi season is usually broadcasted. Chocolate weed seeds that are already present in the soil from the previous crop also germinates with the broadcasted sesame utilizing the residual moisture. Preliminary studies done at Onattukara Regional Agricultural Research Station, Kayamkulam have shown that seeds of chocolate weed needs only 2-3 days for germination whereas sesame seeds can take up to 5-7 days. This short window is sufficient for the weeds to rob the soil off, moisture and nutrients that are intended for sesame. The seeds of chocolate

weed resemble that of sesame seeds and hence it is difficult to separate them. It is also difficult to identify sesame and chocolate weed even at the seedling stage. Hand weeding is a labour-intensive practice since the seeds are broadcasted. Management of *Melochiacorchorifolia* using herbicides is difficult as they may be phytotoxic to sesame. Now, the weed has extended to a larger area at Onattukara as proper management measures were not adopted.

Management of Chocolate weed

The weed seeds are already present in soil from many generations of the crop. Management measures have to be initiated and then continued for a few seasons to fully exhaust the seed bank in soil. The post emergent application of herbicides in sesame is not practically possible as both sesame and chocolate weed are broadleaved and the application of herbicides is phytotoxic to sesame. Moreover, many of the post emergent chemicals used for the control of chocolate weed are banned for use in Kerala. Hence other methods for weed control suitable to the situation may be followed.

Field sanitation

Before planting sesame, field is thoroughly ploughed and all possible weeds are removed. The weeds present in sides and bunds should be removed manually or by using any systemic or contact herbicides. Proper monitoring is necessary to ensure complete removal of the weeds before it sets seeds.

Stale seed bed technique

The land is thoroughly ploughed and then left for two weeks for the weed seeds to germinate. The germinated seeds are then removed by blanket application of any contact or systemic herbicides. If possible, this process may be repeated. Senthilkumar *et. al.* (2019), reported that when properly orchestrated, stale seed bed technique can efficiently control weeds and can lower the herbicide application.

Use of weed free seeds

Since sesame seeds and chocolate weed seeds closely resemble each other, care should be taken during harvest of sesame to avoid mixing up of weed seeds. Before storing sesame seeds, for planting in the next season, they are to be made free from chocolate weed seeds.

Line planting of sesame

Sesame is usually broadcasted at Onattukara to save labour, cost and time. Planting sesame in lines will provide enough space between the rows for weeding at the later stages of the crop. It is observed that more yield is obtained from sesame when planted in lines instead of broadcasting (Islam *et al.*, 2008).

Wider spacing

Sesame is usually planted at a spacing of 15cm x 15cm when planted in lines. When the seeds are broadcasted thinning is done with 15cm spacing. In heavily infested areas adopting a wider spacing of 30 cm x 30 cm or 45cm x 15 cm will ensure enough space

between rows to carry out easyweeding. Conoweeder can be used for weed management in the early stages of weed growth.

Pre-emergence herbicide application

-Application of certain herbicides just after sowing of the crop but before the emergence of weeds is found to be effective in managing the weed population. This is usually done on the same day or within six days of sowing. Raikwar and Srivasta (2013) had found that pre-emergent application of pendimethalin @ 1 kg aiha⁻¹ is effective for managing weed population in sesame. Similar results were obtained when Oxyfluorfen @ 0.15 kg ai ha⁻¹ was applied as pre-emergent (0-6 days after sowing) in rice for controlling chocolate weed (Menon *et al.*, 2020). Preliminary experiments done at Onattukara for management of chocolate weed in sesame also provides promising results for pre-emergence application.

Mulching

Rice straw left after the harvest of rice can be used as mulch. Mulching rice straw after line planting of sesame is effective for weed management. The mulch conserves soil moisture and also prevent sunlight from directly coming in contact with soil. This restricts the establishment of chocolate weed. However, availability of mulch materials in bulk may be a constraint.

Weeding/hoeing

Eventhough hand weeding is a very laborious and cost incurring operation, management of chocolate weedin sesame can be effectively be done. First, hand weeding/hoeing may be done 18-20days after planting sesamum and can be repeated after 45-50 days after planting.

Management of chocolate weed is a difficult task. Based on the resources available and convenience of the farmer, adopting any one of the above operation or integrating a few operations can be done. It would be ideal if the control measures are continued for atleast 2-3 seasons to completely exhaust the weed seed bank.

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