

Studies on the use of Weedicides in the Eradication of Kikuyu grass in the Nilgiris*

by

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Synopsis: The results of studies carried out on the use of weedicides in eradicating the Kikuyu grass, which is a menace on the terraces in the hills of Nilgiris are presented in this article. The weedicide Dowpon at 2½ kg per acre is recommended for application so as to remove the kikuyu effectively and at an economic cost of Rs. 25/- per acre.

Introduction: Kikuyu grass (*Pennisetum clandestinum* Hochst) is a vigorous spreading perennial pasture grass with very good soil binding characteristics, coming up well in areas of higher elevations above 5000 feet, such as on Nilgiris, Pulneys etc. Though its value as a pasture or fodder grass is undisputed, its presence in a cultivated field (as on the faces of terraces in the hills) is undesirable since it becomes a troublesome weed to eradicate, if not kept in constant check. Leaving the lands fallow for even a season or two results in the complete cover of the cultivable terraces of this grass, by means of its rapid growing underground shoot system, which goes even to depth upto 2'. This makes it necessary that, for its eradication, the land should be dug upto not less than 2' depth, involving much labour and cost. It was estimated that it cost nearly Rs. 300/- per acre of level ground or Rs. 160/- per acre of cultivated terraces for the manual digging and removal of this grass. For the continued protection of the soil from the faces of the terraces in the hills, it is therefore, necessary to evolve suitable quick and economical methods of eradicating the Kikuyu grass and its replacement with other improved grasses. Chemical weedicides offer good scope in such a programme. The principles and methods of chemical weed control are dealt with in detail by Crafts and Robbins (1962). The results of a study in this direction, carried out in the hills at Ootacamund for the last two years is presented in this paper.

Previous Work: Narayanan, Alva and Dhyanchand (1959) have reviewed in detail work in this direction. They also reported their own results with chemicals such as TCA (Trichloroacetic acid) CMU (3-p-chlorophenyl-1 dimethyl Urea), Dalapon (2-2-dichloropropionic acid) and concluded that TCA had given the best results and also indicated that dosages lower than that tried by them might be sufficient for the purpose. Attempt have also been made in East Africa by Hocombe (1960) for the control of Kikuyu grass with different degrees of success.

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* Received on 18-2-1965.

Materials and methods: For the present study broad faces of terraces in the scheme area at Ootacamund with dense-thick stands of Kikuyu grass were selected and marked out into plots of 50 square feet area in which sprayings were carried out. The chemicals used for the study were *Dowpon* (2·2 dichloropropionic acid) of Imperial chemical Industries and *Bladex P*, a patent product of Burmah shell limited. The sprayings were started when the grass was in an active growing stage during spring or early summer between the month of March to May. The chemical was used as an aqueous spray, by dissolving the correct quantity of chemical in 100 gallons of water and using proportionate quantity for the plots taken.

Observations: During the year 1963 *Dowpon* alone was sprayed at 3 doses of 1, 2½ and 5 kilograms per acre commencing on 10—3—1963 and sprayed twice at fortnightly intervals. It was observed that while the plots with 2½ and 5 kilograms per acre dose showed symptoms of drying up of leaves from tip downwards from the 3rd day of spraying itself, the plots with 1 kg dose did not show any symptoms, showing its lack of efficacy. Constant observation was also kept on the underground stolens of the grass, which showed that in plots with 5 and 2½ kg spraying, stolons had started drying in the form of wilting and shrivelled appearance from the second month onwards. Later, though there were repeated rains, drying of the aerial as well as underground shoots continued uninterrupted. There was absolutely no revival of any growth from any part of the plant even after six months. A few underground stolons were removed from the sprayed areas, potted separately and observed for signs of growth. These however did not revive any new growth, but from the black discoloured and withered condition ultimately decayed, showing complete death of the plant. During December 1963, slips of improved grasses such as *Phalaris tuberosa*, *Festuca elatior* var *arundinacea* and *Dactylis glomerata* were planted in the areas sprayed with the rains. All the slips planted established well without any exception, and soon put forth good vigorous growth, showing no ill effects of the chemical, as residual action.

During 1964, the study was continued with 2 chemicals viz. *Dowpon* (1½, 2 and 2½ kg per acre) and *Bladex 'P'* (ester forms of 2-4 dichloro phenoxy acetic acid) at doses of 1, 1½ and 2 kg per acre. The sprayings were commenced in May, 1964 and carried out twice at fortnightly intervals and planted with improved grasses. Observations were maintained in detail under various treatments.

It was observed that in the case of *Dowpon*, symptoms of leaf scorching from the tip downwards started from the 3rd day onwards in the 2 and 2½ kg dosages. The one kilogram per acre dose did not exhibit any

symptom of injury. Of the other two strengths, $2\frac{1}{2}$ kg sprayed plots showed quicker effect than 2 kg dosage. Underground stolons, examined at the end of the second fortnightly period, showed large scale blackening, shrivelling and decaying under $2\frac{1}{2}$ kg sprayed plots. The underground stolons potted and observed separately also did not show any renewal of growth but decayed ultimately. In a fortnight after the second spraying, planting of improved grasses was carried out. These established well and within three months of start of the spraying these grasses had grown well.

BLADIX 'P': The effect of this spray was visible in the case of $2\frac{1}{2}$ kg dosage only on the 8th day of spraying in the form of whitish discoloration of the tips of leaves, extending downwards to the stolons in about two months time. Extended observations in the fourth month however, showed regeneration of the underground stolons producing fresh shoots, with bursting out of new shoots from some of the stolons. This suggests that the suppressive effect of the chemical is only temporary but later growth starts out with vigour.

Discussion: From the foregoing, it is clear that weedicides on grasses have a role to play in the eradication of Kikuyu grass. In the case of Dowpon at $2\frac{1}{2}$ kg. per acre, two sprayings are required to be effective in suppressing the growth, especially from the underground regions of the grass, the symptoms of injury becoming apparent even on the third day of spray. The underground organs start wilting in a month after the sprayings. No regeneration of fresh growth is visible, even after a lapse of six months of sprayings. Other grasses planted simultaneously have established well without any deleterious effect from the sprays. In the case of Bladex 'P' however the effect of the spray is only temporary, the suppression of growth lasting a few days only but the effect is not lasting since growth from the stolons were found to take place subsequently, thereby indicating its unsuitability.

Regarding the economics of application, two sprays of Dowpon at $2\frac{1}{2}$ kg. per acre of terraced area cost as follows:—

1. Quantity of chemical Dowpon required for 2200 feet of 3' width of terraces in one acre at $2\frac{1}{2}$ kg. per acre	...	376.2 gm
2. Quantity required for 2 sprays	...	752.4 gm
3. Cost of 752.4 gm @ Rs. 20/- per kg.	...	Rs. 15'00
4. Spray charge @ 2 men per acre per spray @ Rs. 2/- per day for 2 sprays	...	Rs. 8'00
Sundries	...	Rs. 2'00
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	Total Rs.	25'00

Thus at a very small cost of Rs. 25/- one acre (of terraced area covered with Kikuyu grass) can be divested of the grass, so that improved grasses may be planted and developed as a good cover within a short time of 3 months. This compares favourably against the sum of Rs. 70/- worked out by Narayanan *et al* (*loc cit*). The above study, therefore, points to an easy and economical way of replacing Kikuyu grass with improved grasses within a short period of 3 months.

Conclusion and Summary: Kikuyu grass now extensively spread on faces of terraces in the hills need to be eradicated from cultivated areas. Chemical spray have an effective role to play in the programme. Dowpon a weedicide of Imperial Chemical Industries at 2½ kg. per acre is the most effective and economic weed killer in eradicating Kikuyu grass, working out to not more than Rs. 25/- per acre of terraces.

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