bronze and copper the Hall-Petch relation was observed[3,4] to hold good for values of $d^{-\frac{1}{2}}$ greater than $1{\cdot}5\ mm^{-\frac{1}{2}}$. In the present study also it is found that the VHN values are linearly related with $d^{-\frac{1}{2}}$ ($mm^{-\frac{1}{2}}$), for values greater than 0·5.

In order to give an unequivocal explanation as to the observed anomalous behaviour, it is necessary to make a deeper study of the dislocation structure in coarse-grained commercial aluminium.

Conclusion

A critical strain of 14–15% is necessary for extensive grain growth in commercial 2 S aluminium. There exists the possibility of growing single crystals by the recrystallization-anneal technique in this material. Hardness and grain size may be related by a Hall-Petch type equation. The specimens with large grain size show significantly higher hardness.

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PARTHENIUM WEED IN MYSORE STATE AND ITS CONTROL

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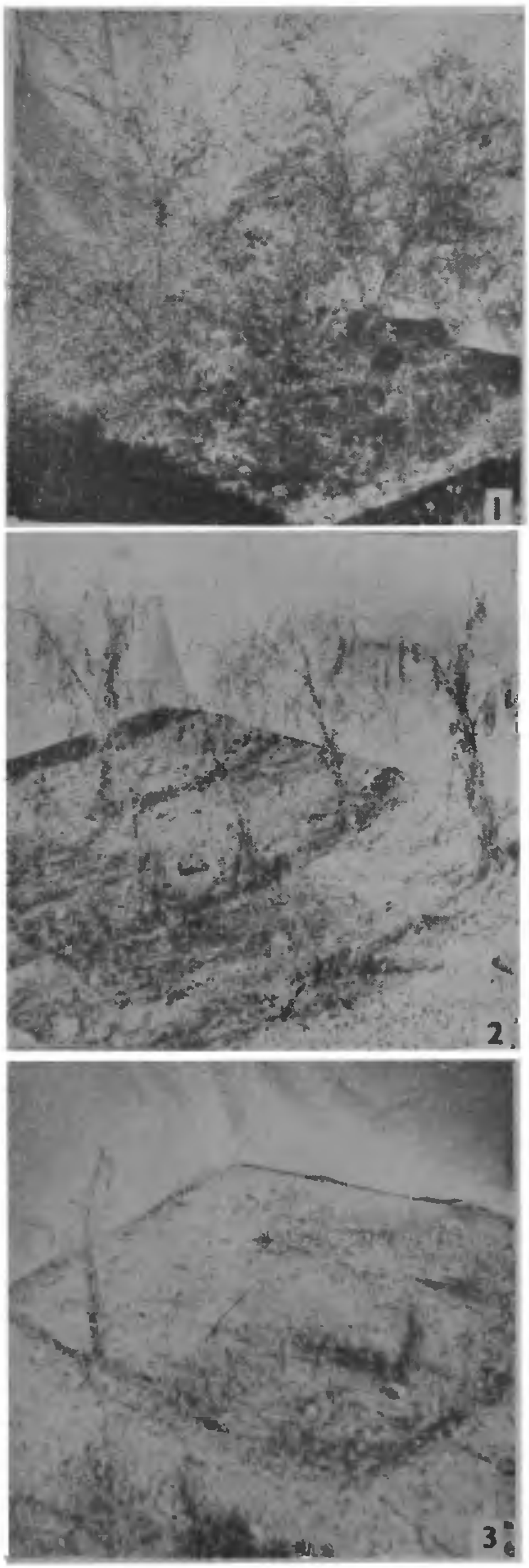
WHITE top (*Parthenium hysterophorus* Linn.), a member of Compositae, is a native of tropical America[8]. It is reported to be widely held that the seeds of this weed came to India with grains imported from U.S.A. or Canada[2]. In India, the weed was first pointed out in Poona (Maharashtra) by Prof. Paranjape in 1951[10], as stray plants on rubbish heaps and was reported by Rao[8] in 1956, as a new record for the country. Since then it has spread to Kashmir[3], Delhi[6] and Madhya Pradesh[7].

In 1961, Ladwa and Patil[5] recorded this weed as a rare plant from Dharwar (Bombay Karnatak region) and so far the weed does not seem to have been reported from any other part of Mysore State. The author has observed the weed in pure dense stands in Bangalore, Mysore, Arasikere, Birur, Bhadravati, Shimoga and many other stations on Bangalore–Talaguppa railway line. Specimens collected from these regions tally well with descriptions given by Rao[8] and Maheshwari[6]. Considering its spread and abundance the weed may be said to have invaded these regions about six years ago. It inhabits goods shed areas, slopy sides of railway track, roadside, edges of canals, wasteland and new construction sites. Similar habitats have been reported for the weed from other parts of India[7,9,10].

Transport seems to be the sole means of dispersal of the weed over long distances. The weed produces alarmingly large number of small fruits which with the help of the two spongy pads attached to their body can very efficiently be disseminated locally by wind and water.

The seedlings come up in abundance in the early monsoon period. The radical leaves spread radially very close to the ground over a considerable area allowing no other seedling to come up. By their vigorous top growth they can overtake any other species in their neighbourhood. They start flowering when about a month old and remain flowering and fruiting profusely for six to eight months. Thus, the prolificity and aggressiveness of the weed contribute a great deal to its quick spread and successful colonization.

Within about two decades the weed has become naturalised in many parts of our country[7]. The gravity of the situation that would arise if the weed is left unchecked, is indicated by many workers. Vartak[10] reported the weed as spreading like a wildfire in Maharashtra encroaching on cultivated fields and grasslands and that a piece of land yielding 9–10 C.L. of grass hardly yields a single C.L. due to this weed. It has also been a menace in forest nurseries[2]. Shelmire (quoted by Maheshwari[7]) has classed this weed among the top seven for their role in contact dermatitis. Its pollen is known to cause allergy[1]. Parthenin, one of the constituent principles characterised, is known to act as a depressant on nervous system in human beings[2]. If such



FIGS. 1-3. Showing the effect of 'Bromacil' on *Parthenium hysterophorus* Linn. Fig. 1. Control. Fig. 2. Plot treated with Bromacil at 2 kg/ha. Fig. 3. Plot treated with Bromacil at 4 kg/ha.

a noxious weed as this is allowed unchecked, it is sure to lose no time in posing a serious threat to agriculture and public health.

It is reported that, as the weed is not known to be affected by any pest or disease, biological methods for its control do not seem possible[1]. Its impact on human health warns against the recommendation of frequent hand weeding. Hence only chemical methods seem promising for the successful eradication of this weed.

From well-replicated field trials carried out during February–May, 1971, in the fallow land of Department of Botany, Central College, Bangalore, it was found that Bromacil (5-bromo-3-sec. butyl-6-methyluracil) at 2 and 4 kg/ha gave cent per cent control of the weed population at the flowering stage (Figs. 1–3). Within a week, leaves of the treated plants showed progressive browning from tips and margins. Later the inflorescences also dried up. The plants died in about a fortnight and did not show any sign of recovery even after four months. 1 kg/ha was not effective in this regard.

It may be concluded from the trials that Bromacil at the rate of 2 kg/ha is effective in killing white top at the flowering stage.

Diquat (9, 10-dihydro-8 a, 10 a-diazonia-phenanthrene-2 A) and MSMA (monosodium acid methanearsonate), at the rate of 0·5 lb and 4 lb/ac respectively, have been reported to be effective in killing white top under Trinidad conditions[4]. Investigations on the sensitivity of the weed at different stages of its growth to Diquat, MSMA and Bromacil and the feasibility of the application of these chemicals to arable land under Bangalore conditions are in progress. The usefulness of the esters of 2, 4-D, some of which are suggested to be effective[1], is also being tested.

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