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Effect of Manual Cutting of *Typha angustata* (Bory & Chub) at Various Stages and Seasons on its Regeneration

By

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ABSTRACT

For eradicating *Typha angustata*, the most troublesome submerged weed of Chambal Command Area, experiments on the effect of various manual cuttings on its regeneration were conducted at Nanta Farm, Kota. The cuttings were made above and below water level at vegetative, flowering and fruiting stages and also in various seasons at different intervals. Cutting below water level at flowering stage was superior to cuttings above water level at vegetative and fruiting stages. The three cuttings at 30 days interval during the rainy season were better than cuttings made in winter and summer seasons at 45 or 120 day intervals. The per cent regeneration after six months of completion of three monthly cuttings in rainy season was only 8.2, while in the case of winter and summer seasons the figures were 104.0 and 53.3 respectively. The 4—12 unplanned cuttings started in seasons other than rainy season could not bring the regeneration to such a low level.

INTRODUCTION

In Chambal Command Area about 10,000 ha are infested with typha weed (Sims and Badal, 1973). Though chemical methods for controlling this weed proved successful, still most of the typha from the drains, minors and water logged areas is being cut by manual labour, apparently due to easy supply of labour at present and shortage of herbicides and sprayers.

Prunster (1940) reported that regular cutting and subsequent maintenance of 37–45 cm of water above cut stalks may control typha to a great extent. Singh *et al.* (1973) also found in artificial pits that cutting at flowering stage and four weeks submergence after cutting were better in comparison to cutting at vegetative and fruiting stages and submergence for a week or two. To find out the best season and frequency of typha cutting for minimising its population, experiments were laid out in Chambal Command Area at Nanta, Kota, and results presented here.

MATERIALS AND METHODS

The experiment was conducted in deep drains having 30—50 cm deep water for almost whole of the season. The cutting of typha was done below (near the bottom) and above the water level at vegetative, flowering and fruiting stages. Before cutting, total number of plants were counted. The size of the plot was 10 m^2 and there were two replications. Observations regarding total number of regenerated typha plants were taken every 15 days upto 90 days (not reported). The last observations were

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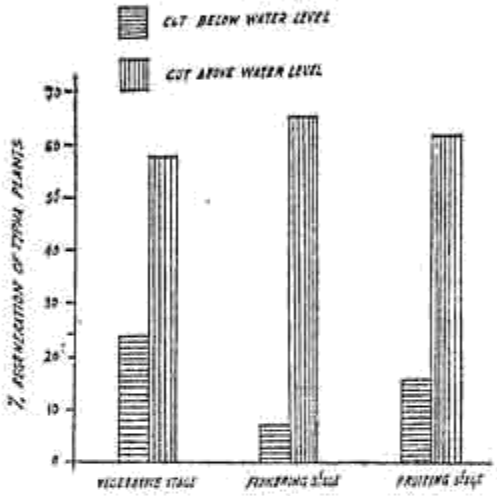
used for calculations of per cent regeneration (Fig. 1). The preliminary experiment confirmed that cutting below water level at flowering stage and keeping the stubbles under water for more than a month keep the typha population very low.

Fig. 1 EFFECT OF SUBMERGENCE ON THE REGENERATION OF TYPHA AFTER ITS CUTTING AT VARIOUS STAGES



The above information helped in planning of experiment at Nanta farm for judging the effect of various seasonal cuttings in the deep drains on typha population. The cuttings made were as follows:

1. One cutting at the beginning and one at the end of each season (summer season, March to June; rainy season, July to October and winter season, November to February).

2. Four cuttings at 30 day intervals in each season.

3. Six cuttings at 45 day intervals in two subsequent seasons, i. e. summer+rainy season, rainy+winter, winter+summer season.

All the cuttings were made below water level. The plot size for each cutting was 30 m². Observations regarding number of typha plants/m² were taken at the time of each cutting. The observations were recorded every month up to sixth month after completion of all the seasonal cuttings (Fig. 2 & 3). In the case of rainy+winter and winter+summer season the

FIG 2. EFFECT OF SEASONAL CUTTINGS ON THE REGENERATION OF TYPHA ANGUSTATA

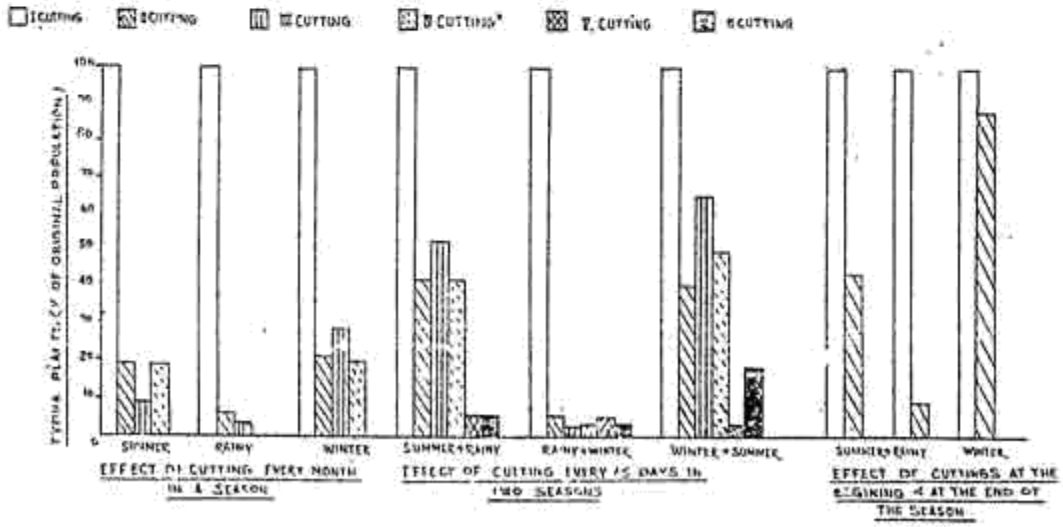
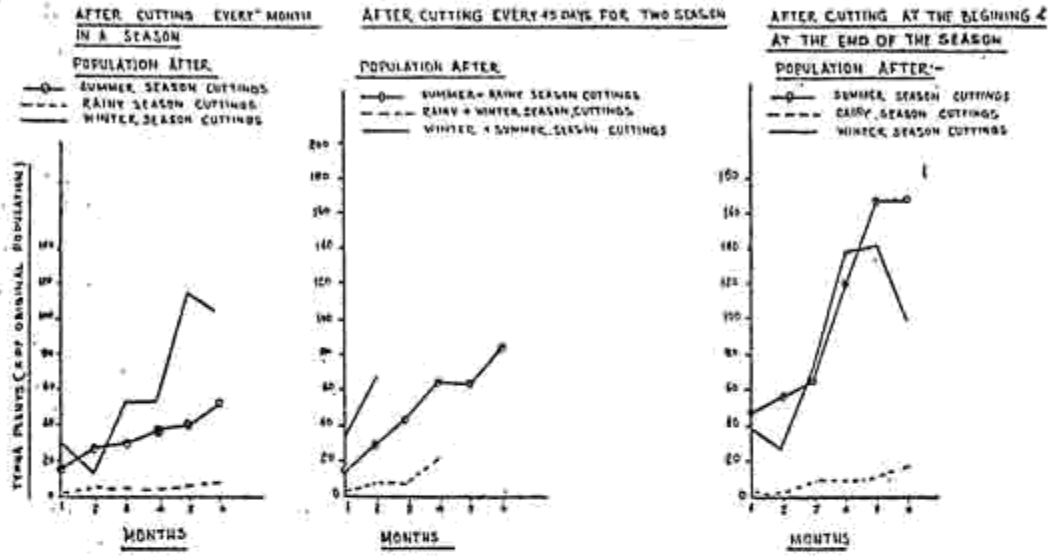


Fig. 3 POPULATION OF TYPHA AFTER COMPLETION OF VARIOUS SEASONAL CUTTINGS

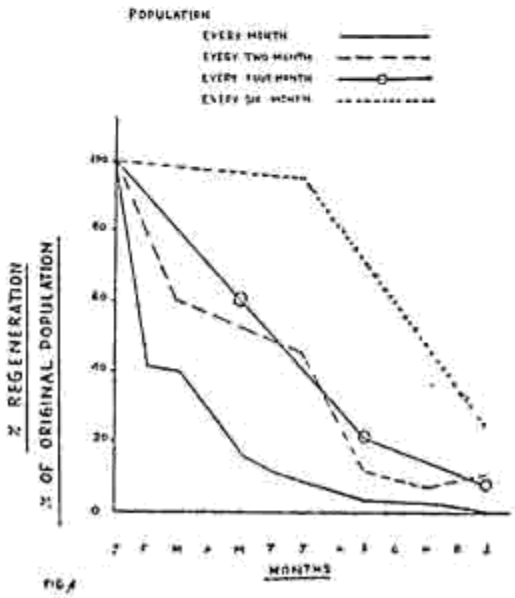


subsequent observations after regular cuttings could be taken only for four and two months, respectively due to the progress of desilting work in that area. The percentage of original population was calculated with the number of typha plants at the time of first cutting.

Another experiment of this series to determine the effect of cuttings made irrespective of the season and stage was conducted in the same drain with 30 m² plot size for each treatment in the month of January, 1973. The cuttings were done after every one, two, four and six months for a year. Observations regarding the percentage of original population were recorded as given for experiment II and shown in Fig. 4.

The depth of water in all the drains was a variable factor and fluctuations depend upon the supply of water to the Nanta minor during the opening and closure of the canal however, during the months of April—June there was a periodical closure o Main canal. During that period the drains were semi wet and in the rainy season these deep drains had wate depth of about 30—50 cm.

Fig. 4 EFFECT OF PERIODICAL CUTTINGS ON THE REGENERATION OF TYPHA ANGUSTATA



RESULTS AND DISCUSSION

The regeneration after the cutting below water level at vegetative, flowering and fruiting stages was 23.1, 7.5 and 15.8 per cent while after cutting above water level it was 57.6, 65.4 and 61.0 per cent respectively (Fig. 1). This shows that under water cutting at flowering stage was definitely superior than vegetative and fruiting stages for the control of typha population.

The results of experiment II show that among the treatments cutting of the plant during rainy season reduced typha population more as compared to the cuttings made in other two seasons (Fig. 2). This may be due to the fact that at the time of this cutting the plants were at flowering stage and cut stubbles and rhizomes remained under anaerobic conditions for almost the whole season (due to rains). Levi (1960) observed that anaerobic conditions convert the reserved starch of the rhizomes into alcohol and organic acids which are harmful to the underground parts of the plants while under aerobic conditions the starch is broken down into carbon dioxide and water.

During summer and winter seasons the plants were at pre-flowering and at dispersal stage respectively and the cut stubbles were exposed many times depending on the short supply of water to the fields. Except in rainy season, cutting at 30 day intervals was better than cutting at 45 and 120 day intervals. In rainy season, cutting at 30 or 45 day intervals was almost similar, as shown by percent population. In this season regeneration of typha after two cuttings at 120 days interval was 3.1 per cent (Fig. 3), while after 3 cuttings at 30 day intervals it was nil. Observations taken after six months of completion of cuttings, indicated that in the area where cutting was done at 120 days interval in rainy season, the regeneration was 16.4 per cent while in the area where cuttings were made at 30 days interval in the same season it was only 8.2 per cent.

The regeneration at the time of last cutting at 30 days interval in summer and winter seasons was about 20 per cent. But after six months of completion of cuttings it was5 3.3 and 104 per cent respectively. In summer season the four repeated cuttings might have exhausted the food from the plant, and the plant could not manufacture food due to dry period of the drain. Moreover the last cutting of summer season was done in June and it is likely that plants could not resprout due to the submergence in rainy season. The same happened in summer season cutting done at 120 day interval. It was found that the % regeneration after this cutting was less as compared to winter season (Fig. 3). The figures for per cent regeneration after six months of completion of typha cutting at pre-flowering (summer season), flowering (rainy season) and fruiting (winter season) stages were 166.4, 16.4 and 100.0 per cent respectively.

Considering the cost of cuttings six cuttings done at 45 day intervals are not worthwhile for reducing the population of typha because the population decreases abruptly only after the rainy season cutting.

The 6—12 cuttings started in seasons other than rainy season could not bring the typha population to zero (Fig. 4). Six cuttings at 60 day intervals are almost similar to 3 cuttings done in rainy season. In the same way cuttings done at 120 and 180 day intervals are not much effective if started in other season, because during this long interval typha population becomes equal to its original population, but if the same cutting is started in the month of July the plant population can be reduced to a great extent.

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REFERENCES

LEVI, E. 1960. Chemical control of *Typha angustifolia* L. var. *brownii*. *Weeds*, 8: 128—38.

PRUNSTER R. W. 1940. The control of Cumbungi (*Typha* spp.) in irrigation channels *J. C. S. & I. R. Australia* **13**: 1—6.

SIMS, D. A. and U. S. BADAL. 1973. Note on the prospects of control of *Typha* spp. in the Chambal Command Area. *Raj. Tech. Report No. 461, Soil and Water Management Project, UNDP/FAO Kota, Rajasthan, India pp. 10.*

SINGH, S. P., S. S. PAHUJA and M. K. MOOLANI. 1973. Cultural control of *Typha angustata* at different stages of growth. *Abst. Meet Regional Seminar on Noxious Aquatic Vegetation in Tropics and Sub-tropics, New Delhi, India 45-46.*