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# CONTROLLING VEGETATION ON INDIAN AERODROMES USING WEEDICIDE: A PRELIMINARY APPRAISAL

by

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**Summary**

An assessment on the effect of weedicide KLASS-80 W. P. was tested on selected test plots on aerodrome area at different concentrations (20 and 30 kg/ha) and monitored over a period of 12 months. The weedicide (30 kg/ha) effectively controlled the vegetation in the test plots while some of the plant species showed resistance to low dosage of weedicide application. The efficacy of the weedicide lasted up to ten months with higher dosage.

**Key Words**: Chemicals, Habitat Modification

## 1. Introduction

Availabilities of food, shelter, safe roosting sites and the least human interference are the factors contributing to the bird congregation on aerodromes. The airport area can be altered so as to make it less attractive to birds by altering its physical environment (Blockpoel, 1976). Ecological studies on Indian aerodromes have shown that the vegetation on the airfield is a major attraction to the problem birds; therefore, the growth of the vegetation should be maintained at minimum level (Grubh, 1988). Sharma (1982) suggested that no grass should be grown on the sides of the airstrip up to 500 metres on both sides on Indian aerodromes. Spraying of insecticide can control the invertebrate population; but, the cost involved is very high and the effect lasts only for few days. Burning of grass has yielded good results on the Srinagar aerodrome (Barnwal, 1982), however, regeneration was found to be occurring at a faster rate.

On Indian airfields, the vegetation is mainly controlled by periodical cutting of grasses. However, during the monsoon months even the low vegetation harbours large number of invertebrates especially grasshoppers which in turn attract the Kites and several other insectivorous birds. This problem persists on aerodromes situated in regions of high rainfall.

In agricultural sectors, herbicides are employed to control the growth of weeds particularly, to control the undesirable growth of weeds among plantations. The dosage of weedicide used here is at low concentration depending upon the plant species to be eliminated. In non agricultural sectors, the weedicides are used at higher concentration for complete elimination of weeds from a particular area. Industrial sectors are employing weedicides to eliminate the fire hazards on their premises. A review of the literature has shown that its use is limited on airports around the world. In French airports, herbicides are applied to limit the growth of grass and proven to be efficient in controlling pigeons (Stenman, 1992). The method consists of spraying the weedicide once in a year during spring.

Hoechst Schering Agrevo Ltd., has recently introduced a weedicide - KLASS 80 W.P. - aiming for use in non agricultural sectors. The manufacturers claim that the effect of this chemical lasts for six to eight months. We have tested the efficiency of this product in the selected test plots on the Baroda aerodrome.

### 1.1 *Product Information*

| | |
|---|---|
| Formulation: | KLASS 80 W. P. contains 800 mg/kg Diuron as active ingredient |
| Mode of action: | Absorbed by the roots, translocation of the compound is via the apoplast of the foliage, Diuron acts as photosynthesis inhibitor (Hill reaction). Half life in soil is 90 -180 days. Metabolism in plants and in the soil is through demethylation/decarboxylation, yielding the aniline which undergoes further oxidation. |
| Retail price: | Rs. 625.00 per Kilogram (approximate) |

## 2. Methods

Twenty-five test plots, each measuring 5 × 5 square metres in size were selected on the Baroda aerodrome, Gujarat, India adjacent to the runway side. These plots were flagged and the plant species present on test plots were identified (table - 1). The weedicide KLASS 80 W. P. was sprayed on the test plots during the monsoon month of August, 1993. A Knapsack sprayer was employed for spraying the weedicide at the following concentrations:

Plot A (five plots): 20 kg/ha
Plot B (five plots): 30 kg/ha
Plot C (five plots): 20 kg/ha on first day followed by a booster dose of 10 kg/ha on day 30

Application of the weedicide was carried out on wet soil and thereafter adequate rain was available for penetration of the chemical into the soil. Control plots were maintained between the test plots. Test plots were observed periodically for twelve months and the plant species perished or surviving were identified.

## 3. Observations

The effect of weedicide on the plants on test plots were observed within seven days of treatment. Many herbs and shrubs showed chlorosis while degeneration was noted in some plants. In a period of 30 days plants except *Zizyphus rotundifolia, Enicostema littorale, Bergia odorata* and *Chrysopogon fulvus* perished. These plants were surviving in all test plots (table - 2). Forty-five days after treatment, only *Bergia odorata* and *Chrysopogon fulvus* were surviving in all the plots. By 90 days of treatment all plant species present on plot B perished. However, in the plot A, the grass *Chrysopogon fulvus* was found surviving. For a period of ten months no new emergence of plants were observed in test plot B and C. Plot A showed survival of grasses and emergence of some herbs. Inspection of test plots during the monsoon months after one year of weedicide application showed emergence of the following plants; *Chrysopogon fulvus, Bergia odorata, Enicostema littorale, Launaea procumbens, Zizyphus rotundifolia, Calotropis gigantea* and *Boerhaavia diffusa* on test plot A. Of these, *Calotropis* species were not present on plot B. Plot C showed the emergence of *Chrysopogon fulvus, Bergia odorata, Enicostema littorale, Launaea procumbens and Boerhaavia diffusa*.

The data over period of one year show that the weedicide Klass 80 W. P. at a dosage of 30 kg/ha is effective against almost all plants, except one species of grass *Chrysopogon fulvus* showed some resistance to the weedicide. However, the density of this grass was found to be reduced in the test plots treated with 30 kg/ha of weedicide. The emergence of some species of plants was noticed after one year. This indicates that the effectiveness of the weedicide decreases over a year.

## 4. Discussion

The weedicide Klass 80 has been found to be effective in controlling the vegetation on the test plots. A dosage of 30 kg/ha totally eliminated the plants in experimental plots while few species showed resistance to low dose (20 kg/ha) of weedicide.

Vegetation present on adjacent control plots was not affected by the weedicide application. The efficiency of the weedicide was lasted as guaranteed by the manufacturer. Presently, we have not studied the physico-chemical properties of the soil, micro-organisms, as well as the faunal components in the test plots. Separate long-term monitoring has been suggested to evaluate the control of vegetation on airfield and its impact on invertebrate fauna and bird population.

## 5. Acknowledgements

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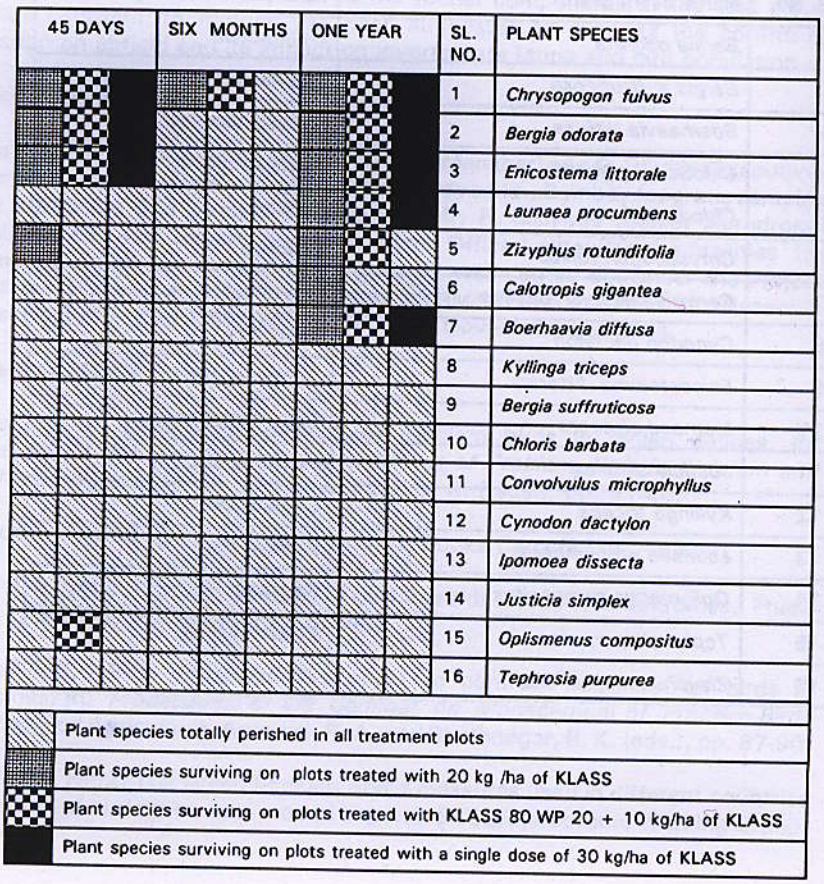
**TABLE 1**

List of Plants Identified from the Plots A, B and C on the Baroda Aerodrome

| S. No. | Name of the plant | Family |
|---|---|---|
| 1 | *Bergia odorata* | Elatinaceae |
| 2 | *Bergia suffruticosa* | Elatinaceae |
| 3 | *Boerhaavia diffusa* | Nyctaginaceae |
| 4 | *Calotropis gigantea* | Asclepiadaceae |
| 5 | *Chloris barbata* | Poaceae |
| 6 | *Chrysopogon fulvus* | Poaceae |
| 7 | *Convolvulus microphyllus* | Convolvulaceae |
| 8 | *Cynodon dactylon* | Poaceae |
| 9 | *Enicostemma littorale* | Gentianaceae |
| 10 | *Ipomoea dissecta* | Convolvulaceae |
| 11 | *Justicia simplex* | Acanthaceae |
| 12 | *Kyllinga triceps* | Cyperaceae |
| 13 | *Launaea procumbens* | Asteraceae |
| 14 | *Oplismenus compositus* | Poaceae |
| 15 | *Tephrosia purpurea* | Papilionaceae |
| 16 | *Zizyphus rotundifolia* | Rhamnaceae |

**TABLE 2**

Effect of Three Different Doses of Weedicide (KLASS 80 W. P.) on Plant Species in the Test Plots after Different Periods of Treatments



| 45 DAYS | SIX MONTHS | ONE YEAR | SL. NO. | PLANT SPECIES |
|---|---|---|---|---|
| | | | 1 | *Chrysopogon fulvus* |
| | | | 2 | *Bergia odorata* |
| | | | 3 | *Enicostema littorale* |
| | | | 4 | *Launaea procumbens* |
| | | | 5 | *Zizyphus rotundifolia* |
| | | | 6 | *Calotropis gigantea* |
| | | | 7 | *Boerhaavia diffusa* |
| | | | 8 | *Kyllinga triceps* |
| | | | 9 | *Bergia suffruticosa* |
| | | | 10 | *Chloris barbata* |
| | | | 11 | *Convolvulus microphyllus* |
| | | | 12 | *Cynodon dactylon* |
| | | | 13 | *Ipomoea dissecta* |
| | | | 14 | *Justicia simplex* |
| | | | 15 | *Oplismenus compositus* |
| | | | 16 | *Tephrosia purpurea* |

Plant species totally perished in all treatment plots

Plant species surviving on plots treated with 20 kg /ha of KLASS

Plant species surviving on plots treated with KLASS 80 WP 20 + 10 kg/ha of KLASS

Plant species surviving on plots treated with a single dose of 30 kg/ha of KLASS