

A COMPUTER BASED NOXIOUS WEED RECORDING SYSTEM

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Summary. A system for noxious weed outbreaks has been developed to record data on noxious weed types, location and control methods. The data is entered and stored on a mainframe with access via a regional visual display unit. Data are available for immediate recall to provide a record of control, and to assist in planning future control operations.

INTRODUCTION

The Division of Primary Industries has responsibility for enforcing noxious weed control throughout the N.T. From 1965 data relating to weed location and control were recorded in field officers' diaries, or on filed copies of paper forms. In the southern region a 'batch' computer procedure was used to record weed locations and observations such as growth stage, seasonal conditions, and soil type, but it did not provide information on control measures.

The objective of the noxious weed recording system reported in this paper is to provide a method of recording all relevant data for weed outbreaks, and to establish a system in which the data can be easily transferred to an emerging MAPNET computer facility.

DATABASE

The Northern Territory Government has a highly centralised computer system. It is supported by the Division of Computing and Information Technology (NCOM) which is an autonomous Division of the Northern Territory Treasury.

The noxious weed recording system is a sub-system within the on-line Division of Primary Industries "Umbrella" transaction. This allows access 24 hours per day to the central IBM3084Q complex via more than 3,000 visual display units (VDU) connected to this network. It also gives access to over 50 gigabytes of main storage under IBM architecture.

The main online delivery system is Customer Information Control System/Virtual Storage (CICS/VS). This is used in conjunction with Information Management System/Data Base (IMS/DB) and Virtual Storage Access Method (VSAM), under a complex multiple CICS region organisation. The Data Base Management System software is managed by Data Base Recovery and Control (DBRC) and Data Dictionary. Data Security is handled by Resource Access Control Facility (RACF). Direct day to day control of security is the responsibility of the division as data owner. This system allows immediate access in Alice Springs, Tennant Creek, Nhulunbuy, Katherine and Darwin.

In 1985, 426 h of programming time was used to develop the initial system with a further 40 h required in 1986 to refine the system to an operational level. The system design required 100 h of programming as did the data base development. The system therefore took over 600 h of NCOM time and considerable time from DPP staff to become operational.

Any officer with the relevant security clearance now has access to the system provided he has available a 43 line VDU. The data is not connected to any other data base as an added security measure.

DATA COLLECTION

Weed staff are based in Alice Springs, Tennant Creek, Katherine and Darwin. Ten staff with responsibility for control and extension cover the 1,346,200 km² area of the Northern Territory. The accurate collection of data is therefore critical to maintain control of weed outbreaks throughout each district. Other government officers and the general public are also encouraged to report weed outbreaks.

Data collected in the field are entered onto paper forms which are a duplicate of the entry screen for the data base (Table 1). A secondary screen is automatically generated for entry of control data (Table 3). This allows for entry of most data via a single form.

Table 1. Data collection and entry screen for the Northern Territory noxious weed recording system

GENUS:	SPECIES:	
TYPE OF WEED :		
REMARKS :		
STATION/PROPERTY OR PARCEL NO:		
REFERENCE COMMENT :		
OWNER:		
MANAGER :		
REGION:		NOXIOUS WEED CLASS:
OUTBREAK NO:	OBSERVED DATE:	INSPECTION DATE:
LOCALITY DESCRIPTION:		
MAP SHEET REFERENCE:	GRID:	AMG:
INFEST STATUS:	MEANS OF IDENT:	PHOTO IND:
INFORMANT:	SEASON:	SOIL TYPE:
SIZE (UNITS):	UNIT CLASS:	DETERMINED BY: DENSITY:
INSPECTION REMARKS:		
OWNER ADVISED:	COMMENT:	
RECOMMENDATION REMARKS:		
CONTROL TYPE:	AGENCY:	RE-INSPECTION DATE:
ERADICATED:		

A genus and species name 'check and select' facility has been included as an aid to the user and to reduce duplications via spelling variations. This check list now holds 203 species of plants, of which 56 are declared under the Noxious Weeds Act. The selected name is automatically taken and listed in the correct fields of the data base. A unique numbering system combines the genus, species, property name, and location.

The panel is displayed with empty fields ready to be filled. The number of empty fields depends upon whether the weed, property and outbreak have previously been recorded. As ownership of properties changes regularly, the data base is designed to only collect basic data on land tenure including crown land areas.

The parameters used to describe an outbreak have been designed for easy retrieval and appraisal (Table 2).

Table 2. Fields of data and possible values used for the noxious weed recording system.

Field	Characters ^a	Possible values
Noxious weed class	1A	A,B,C, OR X IF NOT GAZETTED
Outbreak number	4N	0001 to 9999
Observed date	6N	DD MM YY (Day Month Year)
Inspection date	6N	DD MM YY
Locality description	120 A/N	Description of area
Map sheet reference	6 A/N	1:100 000/1:250 000 scales
Map grid reference	6 A/N	6 digits
Aust map grid zone	2 A/N	52 or 53
Easting	6 A/N	500 000 to 860 000
Northing	7 A/N	7 120 000 to 8 800 000
Infest status	1A	N for New, O for Old
Means of ident	1A	A-AZRI Botanist, B-Berrimah Botanist I-Informant, W-Weeds Officer
Photo	1A	Y for Yes, N for No
Informant	18A	Name
Seasonal conditions	30 A/N	A-Abnormally dry, S-Summer W-Winter, M-Mixed cond.
Soil type	1A	S-Sand, SL-Sandy Loam, C-Clay, CL-Clay Loam, L-Loam G-Gravel, A-Aquatic
Size (units)	5N	Up to 5 digit number
Unit class	1A	C-Count, H-Hectares, M-Square metres, K-Square kilometres, P-Located but not sized, A-Absent/not located
Determined by	1A	V-Rough visual, S-estimated by speed, P-Paced, M-Mapped
Density	2A	SP-Scattered Plants, SC-Scattered Clumps, BS-Block scattered plants, B-Full Block
Size comment	20A/N	Description
Growth	1A/N	I-Immature, M-Mature
	1A/N	G-Green, D-Dry
	1A/N	F-Flowering S-Seeding
	1A/N	V-Vigorous, U-Unthrifty
	1A/N	N-Dense, P-Sparse
Inspection remarks	120A/N	Description

^aA = Alpha; N = Numerical

This allows a coded response to cover all weed outbreaks so far included in the system. They are stored in historical order and so an outbreak history can quickly be obtained on a VDU or printer.

The entry of a selected control type will return the data base for another entry or automatically go to the control measures record if biological (BIO), chemical (CHE) or integrated (INT) is entered (Table 3).

Table 3. Secondary screen showing records of control measures

CHEMICAL-ACTIVE CONTITUENT:		
	TRADE NAME:	
CONCENTRATION: % OR KG	CONTROL VOLUME:	LITRES OR KG/HA
CHEMICAL CARRIER:	WETTING AGENT %:	METHOD:
REMARKS:		
INSECT - GENUS:		SPECIES:
RELEASE (1) DATE:	NUMBER:	SITE (GRID):
(2) :	:	:
(3) :	:	:
(4) :	:	:
RECOVERY REMARKS:		

Data on the weed genus and species and property/outbreak location are maintained from the previous screen. The control measures are then listed in two parts. The first covers the use of chemicals while the latter is for biological control. A combination is used for an integrated approach.

DISCUSSION

The system has been operational in the Darwin Office since November 1986 and is now available through offices in other centres. By March 1987, over 500 records of outbreaks and control operations had been entered for current programs. District Weed Officers and Conservation Commission Rangers now carry recording sheets with them in their field duties and, with their returns, the input of data is expected to increase. In future, maps of the known outbreaks of weeds will be generated on a graphics terminal and overlaid with property boundaries, roads, river catchments, soil and land use data (Mapnet). This should allow a greater understanding of weed distribution, potential spread patterns, and lead to more efficient control operations.

During the first five months of full operation the system has met its basic objectives. The quickly retrieved data on chemical and biological control are used as a record of control and in planning future control operations. As data are collated they will aid in the efficient use of resources for weed control in the Northern Territory.

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