AgRISTARS

Foreign Commodity Production Forecasting

A Joint Program for Agriculture and Resources Inventory Surveys Through Aerospace Remote Sensing

October 1981

DESCRIPTION OF HISTORICAL CROP CALENDAR DATA BASES DEVELOPED TO SUPPORT FOREIGN COMMODITY PRODUCTION FORECASTING PROJECT EXPERIMENTS

W. L. West, III

This draft document consists of technical working material that has not been formally reviewed. It has been prepared in this manner in order to provide timely documentation to personnel supporting the Foreign Commodity Production Forecasting project of the Agriculture and Resources Inventory Surveys Through Aerospace Remote Sensing program and to provide others in the technical community with a means of staying informed of project tasks.

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16. Abstract

The content, format, and storage of data bases developed for the Foreign Commodity Production Forecasting project and used to produce normal crop calendars as a standard product for the U.S. Spring Small Grains and U.S. Corn and Soybean Pilot Experiments are described in this report. The data bases presented are not limited to crop calendar development but may be used for agricultural meteorology, modeling of stage sequences and planting dates, as indicators of possible drought and famine.

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DESCRIPTION OF HISTORICAL CROP CALENDAR DATA BASES DEVELOPED TO SUPPORT FOREIGN COMMODITY PRODUCTION FORECASTING PROJECT EXPERIMENTS

Job Order 72-414

This report describes activities of the Foreign Commodity Production Forecasting project of the AgRISTARS program.

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Under Contract NAS 9-15800

For

Earth Resources Applications Division

Space and Life Sciences Directorate

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LYNDON B. JOHNSON SPACE CENTER
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PREFACE

The Agriculture and Resources Inventory Surveys Through Aerospace Remote Sensing is a multiyear program of research, development, evaluation, and application of aerospace remote sensing for agricultural resources, which began in fiscal year 1980. This program is a cooperative effort of the U.S. Department of Agriculture, the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration (U.S. Department of Commerce), the Agency for International Development (U.S. Department of State), and the U.S. Department of the Interior.

The work which is the subject of this document was performed by the Earth Resources Applications Division, Space and Life Sciences Directorate, Lyndon B. Johnson Space Center, National Aeronautics and Space Administration and Lockheed Engineering and Management Services Company, Inc. The tasks performed by Lockheed Engineering and Management Services Company, Inc., were accomplished under Contract NAS 9-15800.

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1. INTRODUCTION

The content, format, and storage of data bases developed for the Foreign Commodity Production Forecasting (FCPF) project and used to produce normal crop calendars as a standard product for the U.S. Spring Small Grains and U.S. Corn and Soybean Pilot Experiments are described in this document. These data are primarily based on U.S. Department of Agriculture (USDA)/Economics and Statistics Services (ESS)[1] data which have been digitized as card images in a format most compatible for Statistical Analysis System (SAS) software and for quality control and updating.

Software using SAS procedures is continuously under development in response to new requirements for products which use these data in its standard format. The data bases are "living" in the sense that they are frequently updated and corrected as time and data availability permit.

2. DATA BASES

The data bases presented in this document are not limited to crop calendar development. Other potential uses include: (a) agricultural meteorology, (b) modeling of stage sequences and planting dates, and (c) as indicators of possible drought and famine.

The crop stage information recorded is that believed to be visible on Landsat imagery at the time of compilation of crop stage data. In some cases, nonvisible stages of a crop such as soybean podding and corn denting are included as they have been consistently reported when visible stages are not. In those cases, the nonvisible stages serve as a reference for subsequent missing stages. Figure 1 shows eight stages.

[1]Formerly called Economics, Statistics, and Cooperatives Services (ESCS).

Each entry in the data base follows a standard format. The format used for a specific crop will remain constant (i.e., if a user looks at corn in Iowa and then at corn in the Sudan, the format and the stages to be recorded will be the same). See figure 2 for an example of the data base format. The crop stages vary from one to eight depending upon the crop.

The codes (state codes) used for the POLA's[2] within the United States are presented in table 1; these are the U.S. Postal Service zip codes (ref. 1). Codes to be used in foreign areas will also be two letters but will be modified to reflect local circumstances. Explanation of foreign codes will be described in a future publication.

The crop reporting district (CRD) is used as a standard POLB[3] within the United States. A list of the CRD's in each state is presented in table 2 (ref. 2).

Crop codes are listed in table 3. Note that functional use differences are included.[4] Where crops are listed as unidentified, the original source (ref. 3) did not indicate what type of crop was being described.

The stage codes are listed in table 4, whereas, the stages to be recorded by crop are in table 5.

Each POLA is maintained as a separate subdata base. The number of subdata bases available and their extent are shown in table 6; column 2 of table 6 shows the cumulative years available for each state. This total is determined by adding the number of years of data for each crop per POLB plus that for the state. Column 3 of table 6 shows the extent of each data base with appropriate notes as required.

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[2]POLA refers to the first political level within a country; it is a two-letter or two-number code and it may be a state, province, or oblast.

[3]POLB refers to the second political level within a state; it is a two-letter code and it may be a county, CRD, shire, or statistical area. State averages, identified by ST, are also kept in the POLB for convenience.

[4]This term refers to the end usage of a crop; e.g., corn for grain versus corn for silage or forage.

An index is kept for each data base which lists the stages available for each POLB; a typical page is illustrated in figure 3. As a data base is completed, it is put on tape for storage in packed format. The POLA's which are presently completed and stored on tape are listed in table 7. In the three states of Minnesota, South Dakota, and Texas, it was necessary to divide the data base into three parts for easier handling.

3. REFERENCES

1. National Zip Code Directory. U.S. Postal Service, Washington, D.C., 1981.

2. USDA Statistical Reporting Service: County Codes By County Name and Crop Reporting District Maps. Washington, D.C., July 1980.

3. Crop Reporting Board of USDA/ESCS: Enumerator's Manual, 1972 Ground Data Survey. NASA-JSC, Houston, Texas, JSC-13759, April 1979.

TABLE 1.- STATE CODES OF THE UNITED STATES

Code	State	Code	State
AK	Alaska	MT	Montana
AL	Alabama	NB	Nebraska
AR	Arkansas	NC	North Carolina
AZ	Arizona	ND	North Dakota
CA	California	NH	New Hampshire
CO	Colorado	NJ	New Jersey
CT	Connecticut	NM	New Mexico
DE	Delaware	NV	Nevada
FL	Florida	NY	New York
GA	Georgia	OH	Ohio
HI	Hawaii	OK	Oklahoma
IA	Iowa	OR	Oregon
ID	Idaho	PA	Pennsylvania
IL	Illinois	RI	Rhode Island
IN	Indiana	SC	South Carolina
KS	Kansas	SD	South Dakota
KY	Kentucky	TN	Tennessee
LA	Louisiana	TX	Texas
MA	Massachusetts	UT	Utah
MD	Maryland	VA	Virginia
ME	Maine	VT	Vermont
MI	Michigan	WA	Washington
MN	Minnesota	WI	Wisconsin
MO	Missouri	WV	West Virginia
MS	Mississippi	WY	Wyoming

TABLE 2.- POLB LISTINGS BY STATE

State code	POLB Listings
AK	ST 10 20 30 40 50
AL	ST 10 20 21 30 40 50 60 70 80 90
AR	ST 10 20 30 40 50 60 70 80 90
AZ	ST 20 50 70 90
CA	ST 10 20 30 40 50 51 80
CO	ST 10 20 60 70 80 90
CT	ST
DE	ST 20 50 80
FL	ST 10 30 50 80
GA	ST 10 20 30 40 50 60 70 80 90
HI	ST 11 24 35 43 45 55 62
IA	ST 10 20 30 40 50 60 70 80 90
ID	ST 10 30 50 80
IL	ST 10 20 30 40 50 60 70 80 90
IN	ST 10 20 30 40 50 60 70 80 90
KS	ST 10 20 30 40 50 60 70 80 90
KY	ST 10 20 30 40 50 60
LA	ST 10 20 30 40 50 60 70 80 90
MA	ST
MD	ST 10 20 80 90
ME	ST 10 20 30
MI	ST 10 20 30 40 50 60 70 80 90
MN	ST 10 20 30 40 50 60 70 80 90
MO	ST 10 20 30 40 50 60 70 80 90
MS	ST 10 20 30 40 50 60 70 80 90
MT	ST 10 20 30 50 70 80 90
NB	ST 10 20 30 50 60 70 80 90
NC	ST 10 20 30 40 50 60 70 80 90
ND	ST 10 20 30 40 50 60 70 80 90
NH	ST
NJ	ST 20 50 80
NM	ST 10 30 70 90
NV	ST 10 30 80
NY	ST 20 30 40 50 60 70 80 90 91
OH	ST 10 20 30 40 50 60 70 80 90
OK	ST 10 20 30 40 50 60 70 80 90
OR	ST 10 20 30 70 80
PA	ST 10 20 30 40 50 60 70 80 90
RI	ST
SC	ST 10 20 30 40 50 80
SD	ST 10 20 30 40 50 60 70 80 90
TN	ST 10 20 30 40 50 60
TX	ST 11 12 21 22 30 40 51 52 60 70 81 82 90 96 97
UT	ST 10 50 60 70
VA	ST 20 40 50 60 70 80 90
VT	ST
WA	ST 10 20 30 50 90
WI	ST 10 20 30 40 50 60 70 80 90
WV	ST 10 20 30 40 50 60 80
WY	ST 10 20 30 40 50

TABLE 3.- CROP CODES[a]

Crop code	Crop	Crop code	Crop
AH	Alfalfa	OH	Hay, other (unidentified)
AH	Alfalfa, silage	OHC	Hay, other (clover
AP	Apples	OHL	Hay, other (lespedeza)
BR	Barley	OHW	Hay, other (wild)
BRW	Barley, winter	PAC	Peaches
BW	Buckwheat	PE	Peanuts
CR	Popcorn	PO	Potatoes, unidentified
CRB	Corn, broom	POI	Potatoes, Irish
CRG	Corn, grain	POS	Potatoes, sweet
CRF	Corn, forage	PS	Peas
CRS	Corn, silage	DPS	Peas, dry
CRT	Corn, sweet	RI	Rice
CT	Cotton	RY	Rye
DB	Beans, dry	RYW	Rye, winter
CB	Beans, castor	SB	Sugar beets
DW	Wheat, durum	SC	Sugar cane
FX	Flax	SF	Safflower
FXW	Flax, winter	SO	Soybeans
GU	Guar	SRG	Sorghum, grain
LE	Lentils	SRF	Sorghum, forage
MG	Grain, mixed	SRS	Sorghum, silage
ML	Millet	SU	Sunflower
MN	Mint	SW	Wheat, spring
MU	Mustard	TB	Tobacco
OAG	Oats, grain	TBB	Tobacco, burley
OAH	Oats, hay	WW	Wheat, winter
OAW	Oats, winter		

[a]Codes have been modified.

TABLE 4.- STAGE CODES

Code	Stage	Code	Stage
VC	Vines cut	M	Mature (Ripe)
B	Bloom	OB	Open bolls
BO	Boot	P	Plant (Includes transplanted crops)
C	Cut (Hay crops only)	PO	Pod
D	Dent	S	Shed (Natural or man-made)
E	Emergence	T	Turning
H	Harvest (Includes synonymous terms)	TA	Tassel
HD	Head	TI	Tillering
J	Joint	TO	Topping

TABLE 5.- STAGES TO BE RECORDED

[Crops with functional differences (e.g., sorghum for silage or forage) follow the same pattern as the major crop, sorghum for grain.]

Crop	Stage[a]							Crop	Stage[a]								
Alfalfa	1C.....nC							Hay, other (unidentified)	C								
Apples	H							Hay, clover	P	C							
Barley	P	E	HD	T	M	H		Hay, lespedeza	C								
Barley, winter	J	HD	T	M	H	P	E	Hay, wild	C								
Buckwheat	P	E	HD	T	M	H		Peaches	H								
Popcorn[b]	P	—	—	—	—	H		Peanuts	P	E	B	M	H				
Corn, broom[b]	P	—	—	—	—	H		Potatoes, (unidentified)	P	E	B	VC	H				
Corn, grain	P	E	TA	D	M	H		Potatoes, Irish	P	E	B	VC	H				
Corn, forage	H							Potatoes, sweet	P	E	B	VC	H				
Corn, silage	H							Peas	P	—	—	—	H				
Corn, sweet[b]	P	—	—	—	—	H		Peas, dry	P	—	—	—	H				
Cotton	P	E	B	OB	—	H		Rice	P	E	HD	T	M	1H	2H		
Beans, dry	P	E	B	VC	H			Rye	P	E	HD	T	M	H			
Beans, castor	P	E	B	VC	H			Rye, winter	J	HD	T	M	H	P	E		
Wheat, durum	P	E	HD	T	M	H		Sugar beets	P	E	—	H					
Wheat, spring	P	E	HD	T	M	H		Sugar cane	P	E	—	H					
Flax	P	E	B	T	M	H		Safflower	P	E	—	—	H				
Flax, winter	B	T	M	H	P	E		Soybeans	P	E	B	PO	T	S	M	H	
Guar	P	E	—	—	H			Sorghum, grain	P	E	HD	T	M	H			
Lentils	P	E	—	H				Sorghum, forage	H								
Grains, mixed	P	E	HD	T	M	H		Sorghum, silage	H								
Millet	P	E	HD	T	M	H		Sunflower	P	E	B	S	T	M	H		
Mint	P	—	—	H				Tobacco	P	B	TO	H					
Mustard	P	—	—	H				Tobacco, burley	P	B	TO	H					
Oats, grain	P	E	HD	T	M	H		Wheat, winter	J	HD	T	M	H	P	E		
Oats, hay	H																
Oats, winter	J	HD	T	M	H	P	E										

[a]Stages shown by a dash (—) indicate that a stage exists or is assumed to exist but information is unavailable.

[b]It is presumed that this type follows the stage pattern for grain corn.

TABLE 6.- AVAILABLE DATA BASES AND THEIR EXTENT

State	The years' data	Extent
Arkansas	92	State and CRD 6
Colorado	414	State and CRD
Delaware	10	State (CRG and SO only)
Georgia	400	State and CRD
Idaho	69	CRD 1 and 9
Illinois	220	State and CRD
Indiana	621	State and CRD
Iowa	627	State and CRD
Kansas	541	State and CRD
Kentucky	14	State
Louisiana	21	State
Maryland	56	State
Minnesota	1322	State and CRD
Mississippi	56	State
Missouri	310	State and CRD
Montana	612	State and CRD
Nebraska	425	State and CRD
North Carolina	529	State and CRD
North Dakota	681	State and CRD
Ohio	271	State and CRD
Oregon	6	State and CRD (WW only)
South Carolina	397	State and CRD
South Dakota	848	State and CRD
Tennessee	268	State and CRD
Texas	1368	State and CRD
Washington	120	State and CRD
Wisconsin	200	State and CRD
Wyoming	22	State

TABLE 7.- EODLS TAPE I07078 ARCHIVE LISTING

[Complete POLA's (Packed)]

File number	State and data
1	IN POLA A5 ..... Delete, updated version file 43
2	IA POLA A5 ..... Delete, updated version file 42
3	IL POLA A5 ..... Delete, updated version file 44
4	MN POLA A5 ..... State data only
5	MN POLA2 A5 ..... CRD small grains only
6	MN POLA3 A5 ..... CRD nonsmall-grains only
7	OR POLA A5
8	GA POLA A5
9	NC POLA A5
10	CO POLA A5
11	MT POLA A5
12	NB POLA A5
13	ND POLA A5 ..... Delete, updated version file 41
14	SD POLA A5 ..... CRD small grains only
15	SD POLA2 A5 ..... CRD nonsmall-grains only
16	SD POLA3 A5 ..... CRD sorghum grain and state (all crops)
17	SC POLA A5
18	WY POLA A5
19	DE POLA A5
20	KS POLA A5
21	TN POLA A5
22	TX POLA A5 ..... State through CRD 21 (all crops)
23	TX POLA2 A5 ..... CRD 22 through 60 (all crops)
24	TX POLA3 A5 ..... CRD 60 through 97 (all crops)
25	MO POLA A5
26	OH POLA A5
27	WA POLA A5
28	WI POLA A5
29	IL 1980 A5 ... Delete, combined with IL POLA file 44
30	IA 1980 A5 ..... Delete, combined with IA POLA file 42
31	IN 1980 A5 ..... Delete, combined with IN POLA file 43
32	OK POLA A5
33	MS POLA A5
34	AR POLA A5
35	AL POLA A5
36	MD POLA A5
37	LA POLA A5
38	KY POLA A5
39	PA POLA A5
40	MI POLA A5
41	ND POLA A5 ..... Updated version
42	IA POLA A5 ..... Updated version
43	IN POLA A5 ..... Updated version
44	IL POLA A5 ..... Updated version
45	ID POLA A5

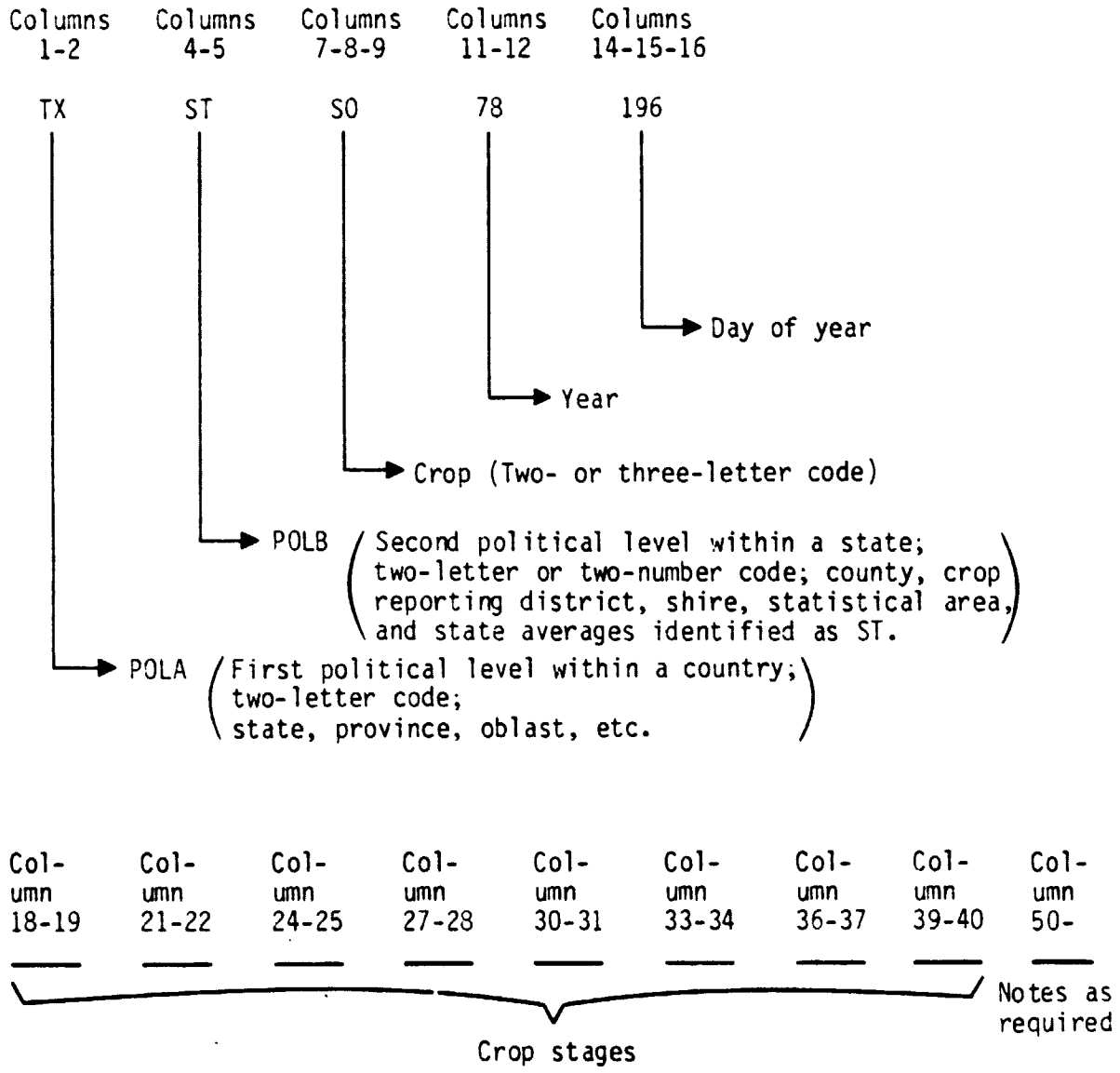

Figure 1.- Standard entry.

```
FILE: MS        POLA      A

MS  10   WW  79  308                                    78
MS  10   WW  79  315                                    84
MS  10   WW  79  322                                    84
MS  10   WW  79  329                                    97
MS  10   WW  79  336                                    97
MS  10   WW  79  343                                    98
MS  10.  WW  79  350                                    99
MS  10  CRG  75   95  15
MS  10  CRG  75  102  22
MS  10  CRG  75  109  33
MS  10  CRG  75  116  40  27
MS  10  CRG  75  123  47  36
MS  10  CRG  75  130  64  55
MS  10  CRG  75  137  83  78
MS  10  CRG  75  144  88  83
MS  10  CRG  75  151  93  90
MS  10  CRG  75  158  97  92
MS  10  CRG  75  165  98  95
MS  10  CRG  75  172  99  99
MS  10  CRG  75  179          50
MS  10  CRG  75  186          64
MS  10  CRG  75  193          83
MS  10  CRG  75  200          93  10
MS  10  CRG  75  207          99
MS  10  CRG  75  221              31
MS  10  CRG  75  235              75  10
MS  10  CRG  75  242              85
MS  10  CRG  75  249                  30  10
MS  10  CRG  75  263                  70  25
MS  10  CRG  75  270                  95
MS  10  CRG  75  277                  99  80
MS  10  CRG  75  284                      90
MS  10  CRG  75  298                      91
MS  10  CRG  75  305                      98
MS  10  CRG  75  312                      98
MS  10  CRG  75  319                      98
MS  10  CRG  75  326                      99
MS  10  CRG  76   73   0
MS  10  CRG  76   87  10
MS  10  CRG  76   94  50
MS  10  CRG  76  101  55  10
MS  10  CRG  76  108  80  50
MS  10  CRG  76  115  84  55
MS  10  CRG  76  122  85  62
MS  10  CRG  76  129  90  63
MS  10  CRG  76  136  97  93
MS  10  CRG  76  143  99  99
MS  10  CRG  76  185          80
MS  10  CRG  76  192          90
MS  10  CRG  76  199          90
MS  10  CRG  76  206          90   5
MS  10  CRG  76  213          95   5
MS  10  CRG  76  227              60
MS  10  CRG  76  241              93  23
MS  10  CRG  76  248                  90  30
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MS  10  CRG  76  262                  90  30
MS  10  CRG  76  269                  99  40
MS  10  CRG  76  283                      93
MS  10  CRG  76  290                      93
MS  10  CRG  76  297                      98
MS  10  CRG  76  304                      98
MS  10  CRG  76  311                      98
MS  10  CRG  76  318                      99
MS  10  CRG  77   71   0
MS  10  CRG  77   78   3
MS  10  CRG  77   92  30
MS  10  CRG  77   99  37
MS  10  CRG  77  106  75  15
MS  10  CRG  77  113      45
MS  10  CRG  77  120  75  60
MS  10  CRG  77  127  95  65
MS  10  CRG  77  134  95  87
MS  10  CRG  77  141  99  95
MS  10  CRG  77  148      99
MS  10  CRG  77  176          70
MS  10  CRG  77  183          97
MS  10  CRG  77  197          97
MS  10  CRG  77  204          99  80
```

Figure 2.- Example of data base format.

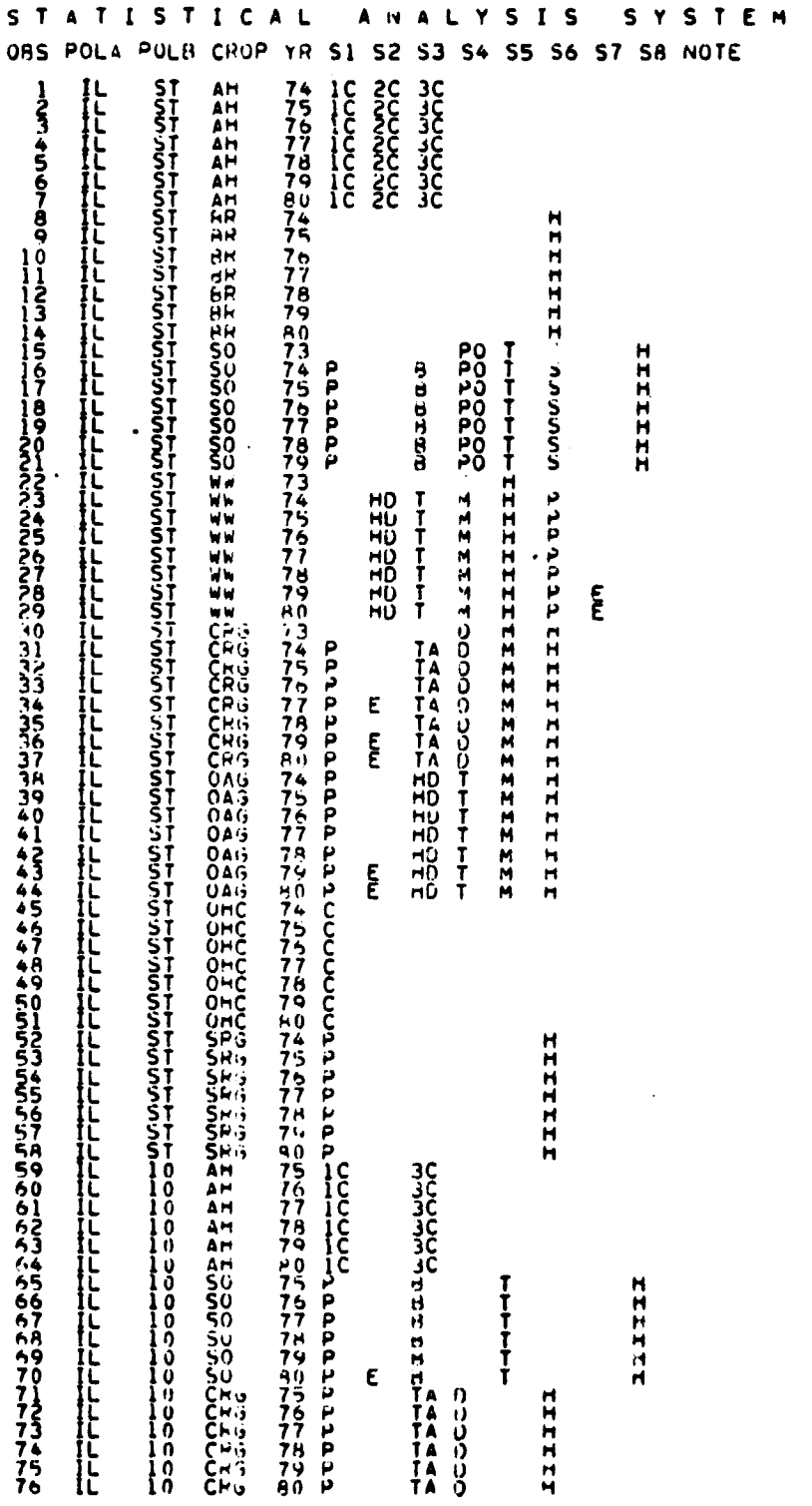

Figure 3.- A typical page of the index kept for each data base.