WILDOAT

Wheat and Barley Yield Reductions Due to Wild Oat Infestations

Version 1.1
for the
IBM Personal Computer

By

E.H. Vasey
Extension Soils Specialist

J.D. Nalewaja
Professor of Weed Science, Agronomy Department

Mike Vasey and Rick Koon
Student Computer Programmers

Plant Science Section
North Dakota Cooperative Extension Service
North Dakota State University
Introduction

North Dakota producers likely spend more for control of wild oat infestations in small grains than for any other weed. Losses due to wild oat infestations in small grains have been estimated at $130 million annually.

"WILDOAT" is designed to predict yield reduction due to wild oat infestation in either wheat or barley. "WILDOAT" will also allow calculation of cost versus return for recommended herbicide applications. "WILDOAT" was written in BASICA and uses a database built with PC-FILE. "WILDOAT" was developed by Dr. E.H. Vasey, Extension Soils Specialist at North Dakota State University using data collected by Dr. John Nalewaja, Agronomy Department, North Dakota State University (1,2). Programming was done by Michael Vasey and Rick Koon, Student programmers, North Dakota State University.

Instructions

Insert the "WILDOAT" diskette in drive A and turn your system on. The program will automatically load and run. If your system is on, insert the diskette into drive A and re-boot the system by simultaneously depressing the Ctrl and Alt keys, then press the Del key.

Screen 1: Presents an overview of the program and references Extension Circulars pertinent to the program ("Agricultural Weed Control Guide" [3] and "Crop Production Guide" [4]).

Screen 2: Presents a menu for crop selection and a prompt for identification of crop choice by number. You may also seek help or stop (return to DOS) the program by pressing the indicated function keys on line 25 of the screen.

Screen 3: You are first prompted for the projected yield of the selected crop in bushels per acre (bu/A). Normal yield estimates can be based on experience, on variety performance data from branch experiment stations or on detailed soil survey reports. Enter a yield rounded to the nearest whole number or no more than one decimal point to the right (e.g. 34 or 34.5).

If barley is selected, you will be asked about the soil fertility level by indicating if the barley is to be grown on a soil with high fertility (fertilized) or low fertility (non-fertilized). The data used in the program showed less yield loss due to wild oat competition when the barley was grown under high fertility (fertilized) (2). The difference due to soil fertility level (fertilization) of wheat did not justify using separate equations (1).

You will then be prompted for the level of infestation of wild oat plants per square yard. A good estimate can be obtained by counting the wild oat plants in several 1 square yard samples and finding the average. Some rough estimates might be 10 for a mild infestation, 40 for a moderate infestation and 80 or more for a severe infestation. Enter an infestation level rounded to the nearest whole number.

In either case you may request help or stop the program (return to DOS) by pressing the appropriate function keys (NOTE: this will hold true throughout the program when the keys are displayed on line 25 of the screen and will not be mentioned again in this guide).

Screen 4: Presents the predicted percent yield reduction and the expected yield after the percent yield reduction has been applied to the predicted yield. You then have the option of seeing a cost versus return routine. Answering yes presents screen 5.

Screen 5: Screen 5 begins by displaying all recommended herbicides for the chosen crop. A recommended herbicide can be selected by number or a herbicide of your choice can be inputed by pressing the [F1] key. You will then be prompted to answer 4 additional question: 1) cost per acre for application—this can be your inputted cost or the cost for typical custom application rates; 2) price per gallon or per pound for the herbicide. If you purchase herbicides in large quantities and need to find a per gallon or per pound price the program will assist if the HELP function ([F1] key) is selected. Here you only need to know the size of the container (i.e. 30 gal drum, 5 gal bucket, 100 lb sack) and the cost for the container. The program will calculate the price and automatically store it for use; 3) you will then be prompted for the application rate in pints per acre or pounds per acre. You should make sure to enter the appropriate figures since inaccurate figures will yield false results! The low and high recommended rates are provided for the recommended herbicides and 4) the last prompt in this series asks for the expected selling price per bushel for the chosen crop. Any price can be entered but realistic prices will provide more accurate results than unrealistic prices. Daily price quotes from news sources, quotes from an elevator or prices based on experience would all be good sources.

The program will display the given information and ask if the data is correct after all the information has been entered. Responding yes will clear the screen and present the user with cost, control and return figures and a statement on whether wild oat control would or would not be economical. The results may be printed for a permanent record. (Make sure your printer is on!) If you respond no to the data correct question, you will be prompted to give the number of the statement with the incorrect data. The question corresponding to the given number will appear and the error can be corrected. This option can be continued as long as needed to update or correct the information.
After responding to the printout option, you will be prompted to compare cost versus return for another herbicide. Responding yes returns the program to screen 5 and the prompts repeat from there. Answering no clears the screen and asks if you would like to make another prediction. Answering no stops program execution and returns control to DOS, responding yes returns the program to screen 2.

A note for WILDOAT users

Wildoat 1.1 uses a database built by PC-File. You may add, delete or modify the records for the recommended herbicides by running PC-File in drive A and using the wildoat disk in drive B. The database is labeled WILDOATS and consists of seven fields. 1) Herbicide—the commercial name of the herbicide, 2) crop—what crop the herbicide is used on (NOTE: if the herbicide can be used on wheat and barley you will need two entries, one for wheat and one for barley), 3) low rate—the recommended low rate of application as listed in the latest edition of 'Agricultural Weed Control Guide' (3), 4) high rate—the recommended high rate of application as listed in the latest edition of 'Agricultural Weed Control Guide' (3), 5) costs—the cost per gallon or per pound for the herbicide, 6) rating—the relative herbicide effectiveness as indicated in the 'Agricultural Weed Control Guide' (3) and 7) comments—any remarks you would like to make up to 35 characters in length.

By using a database approach you can modify the data to fit local conditions.

REFERENCES


North Dakota State University and the program authors shall have no liability or responsibility to any person or entity with respect to any liability, loss or damage caused or alleged to be caused directly or indirectly by this software, including, but not limited to any interruption of service, loss of business or anticipatory profits or consequential damages resulting from the use or operation of this software.
WILDOAT is designed to predict yield reduction due to wild oat infestation in either wheat or barley.

WILDOAT will also allow you to calculate cost vs. return for recommended herbicide application.

WILDOAT was developed by Dr. E.H. Vasey, Extension Soils Specialist at North Dakota State University.

WILDOAT utilizes data collected by the Weed Science Staff in the Agronomy Department at NDSU.

Refer to current Weed Control Guide (Extension Circular W-253) or current Crop Production Guide for more complete information on wild oat control in wheat or barley.

press any key to continue

SCREEN 1

CROP CHOICES ARE:
1. WHEAT
2. BARLEY

Enter your choice of crop (by number)

[F1] HELP  [F2] STOP

SCREEN 2
What is your projected yield of BARLEY in bu/a 33

Is your BARLEY on fertilized (f) or non-fertilized (nf) soil (fertilized consists of adequate rates of Nitrogen and Phosphorus) f

What is the number of wildoat plants per square yard (if the number exceeds 250 then use 250) 100

[F1] HELP  [F2] STOP

SCREEN 3 (after selecting Barley option)

An infestation of 100 wildoats per square yard can reduce your yield by 16 percent.

Your yield may be reduced from 33 bu/a to 27.7 bu/a unless wild oats are controlled.

Do you wish to see a cost vs. return for herbicide application (Y/N)

SCREEN 4
The recommended herbicides for BARLEY are:

<table>
<thead>
<tr>
<th>HERBICIDE</th>
<th>LOW</th>
<th>HIGH</th>
<th>COST</th>
<th>RATING</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 AVADEX (L)</td>
<td>1.25pt</td>
<td>1.25pt</td>
<td>32.00/gal</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>2 AVENGE</td>
<td>2.5pt</td>
<td>4.0pt</td>
<td>36.50/gal</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>3 CARBYNE</td>
<td>1.0pt</td>
<td>1.5pt</td>
<td>39.50/gal</td>
<td>F·G</td>
<td>Control may be erratic see label</td>
</tr>
<tr>
<td>4 FAR-GO 10G</td>
<td>10 lb</td>
<td>15 lb</td>
<td>0.71/gal</td>
<td>G</td>
<td>for spring-fall rate</td>
</tr>
<tr>
<td>5 FAR-GO 4L</td>
<td>1.25pt</td>
<td>1.25pt</td>
<td>32.00/gal</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>6 HOELON</td>
<td>2.0pt</td>
<td>2.7pt</td>
<td>46.00/gal</td>
<td>G</td>
<td>Foxtail control also</td>
</tr>
</tbody>
</table>

RATINGS: G = GOOD  F = FAIR  P = POOR  N = NONE  S = Seldom  O = Often

1. Choose by number the herbicide you will apply ([F1] for own)

[F1] Own herbicide

SCREEN 5 (shows the first of five prompts)
BASIC PROGRAM FLOW FOR WILDOAT

1. Logo
2. Comments
3. Barley
   - Calculate Yield Reduction
4. Wheat
   - Calculate Yield Reduction
5. Results
6. No
   - Cost Return
   - Recommended Herbicides
   - Calculate Cost vs. Return
   - Results
7. Yes
   - Another
8. Yes
   - Another
9. No
   - DOS
10. Yes
    - Another
11. Yes
    - Another
12. No
    - DOS
**DATA DICTIONARY FOR WILDOAT**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST$</td>
<td>A string of 79 blanks. Used throughout the program to erase lines</td>
</tr>
<tr>
<td>FKEY$</td>
<td>labels the function keys that the user has access to</td>
</tr>
<tr>
<td>Num%</td>
<td>the number of records currently stored in WILDOATS.INX</td>
</tr>
<tr>
<td>FILE$</td>
<td>a two dimensional array containing NUM% records each consisting of seven fields:</td>
</tr>
<tr>
<td>- Herb$</td>
<td>the commercial name of the herbicide</td>
</tr>
<tr>
<td>- Crop$</td>
<td>the crop (wheat and/or barley) the herbicide is recommended for</td>
</tr>
<tr>
<td>- Low$</td>
<td>the recommended low application rate</td>
</tr>
<tr>
<td>- High$</td>
<td>the recommended high application rate</td>
</tr>
<tr>
<td>- Rating$</td>
<td>the effectiveness of the herbicide</td>
</tr>
<tr>
<td>- Comments$</td>
<td>any remarks up to 34 characters in length</td>
</tr>
<tr>
<td>Price, Pr</td>
<td>the price the user will pay per gallon or per pound for the herb$</td>
</tr>
<tr>
<td>Rate</td>
<td>the rate in pints/A or pounds/A herb$ will be applied</td>
</tr>
<tr>
<td>Sell</td>
<td>the price the user expects to sell his crop at. The price is per bushel.</td>
</tr>
<tr>
<td>TAL</td>
<td>total price/A for application and herb$</td>
</tr>
<tr>
<td>NCR</td>
<td>gross return a user can expect with no control of wildoats</td>
</tr>
<tr>
<td>CR</td>
<td>the gross return a user can expect with 100% control of wildoats</td>
</tr>
<tr>
<td>D</td>
<td>difference when compared with TAL will determine if control is cost effective</td>
</tr>
<tr>
<td>Fert$</td>
<td>used in barley routines. Holds values &quot;f&quot; for fertilized soil or &quot;nf&quot; for non-fertilized soil</td>
</tr>
<tr>
<td>O,W,A,B</td>
<td>internal variables to hold various results to equations</td>
</tr>
<tr>
<td>J%, I%</td>
<td>used in For-Next loops</td>
</tr>
<tr>
<td>HN</td>
<td>herbicide number. Allows the user to select herbicide by number rather than typing in the name</td>
</tr>
</tbody>
</table>

The following variable are from the Screenin routine taken from "Advanced Basic and Beyond" by Dr. L. Goldstein. See program listing or text for definitions.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>XFLD</td>
<td>Csr</td>
</tr>
<tr>
<td>YFLD</td>
<td>Inputend</td>
</tr>
<tr>
<td>S$</td>
<td>true</td>
</tr>
<tr>
<td>T$</td>
<td>false</td>
</tr>
<tr>
<td>Lastpos</td>
<td>C</td>
</tr>
<tr>
<td>caller</td>
<td>C$</td>
</tr>
<tr>
<td>Ingth</td>
<td>ES$</td>
</tr>
</tbody>
</table>
Program WILD OAT predicts yield reduction due to WILD OAT infestation plus gives an economic cost vs. return analysis for herbicide use.

program written by: Michael Vasey
revised by: Ricky M. Koon, June 1984, July 1984

CLEAR: KEY OFF: SCREEN 0,0,0: COLOR 7,0
ON ERROR GOTO 3295: ST$ = STRING$(79,32)
FKET$ = "[F1] HELP     [F2] STOP"

INITIALIZE FILE$

NUM% = 0
OPEN "WILDOATS.INX" AS #1 LEN = 18
FIELD #1, 14 AS X.INX$, 4 AS POINT.INX$
GET #1
IF LEFT$(X.INX$,1) = "/" THEN 95
IF LEFT$(X.INX$,1) = "\" THEN 120
NUM% = NUM% + 1
GOTO 95
CLOSE
DIM FILE$(NUM%,7)
REC% = 1
OPEN "WILDOATS.INX" AS #1 LEN = 18
FIELD #1, 14 AS X.INX$, 4 AS POINT.INX$
OPEN "WILDOATS.DTA" AS #2 LEN = 77
FIELD #2,10 AS HERB$,6 AS CROP$,6 AS LOW$,6 AS HIGH$,10 AS COST$,3 AS RATING$,35 AS COMMENTS$
GET #1
IF LEFT$(X.INX$,1) = "/" THEN 155
IF LEFT$(X.INX$,1) = "\" THEN 225
POINTER = VAL(POINT.INX$)
GET #2
FILES(REC%,1) = HERB$
FILES(REC%,2) = CROP$
FILES(REC%,3) = LOW$
FILES(REC%,4) = HIGH$
FILES(REC%,5) = COST$
FILES(REC%,6) = RATING$
FILES(REC%,7) = COMMENTS$
REC% = REC% + 1
GOTO 155
CLOSE

INITIALIZE SCREENIN ROUTINE
FOR J% = 1 TO 10: KEY J%,"": NEXT J%
DIM MINKEY(9), MAXKEY(9), EXTMINKEY(9), EXTMAXKEY(9), SPECIALKEY$(9), EXTREASURE$(9): TRUE = -1: FALSE = 0
MINKEY(1) = 49: MAXKEY(1) = 50: EXTMINKEY(1) = 59: EXTMAXKEY(1) = 60: SPECIALKEY$(1) = CHR$(13)+CHR$(8)+CHR$(27)+"12": EXTREASURE$ = ""
MINKEY(2) = 48: MAXKEY(2) = 57: EXTMINKEY(2) = 59: EXTMAXKEY(2) = 60: SPECIALKEY$(2) = CHR$(13)+CHR$(8)+CHR$(27): EXTSPECIALKEY$ = ""

MINKEY(3) = 46: MAXKEY(3) = 57: EXTMINKEY(3) = 59: EXTMAXKEY(3) = 60: SPECIALKEY$(3) = CHR$(13)+CHR$(8)+CHR$(27): EXTSPECIALKEY$ = ""

MINKEY(4) = 65: MAXKEY(4) = 122: EXTMINKEY(4) = 0: EXTMAXKEY(4) = 0: CAPSON(4) = -1: SPECIALKEY$(4) = CHR$(13)+CHR$(8)+CHR$(27): EXTSPECIALKEY$ = ""

MINKEY(5) = 49: MAXKEY(5) = 53: EXTMINKEY(5) = 59: EXTMAXKEY(5) = 59: SPECIALKEY$(5) = CHR$(8)+CHR$(13)+CHR$(27)+"12345": EXTSPECIALKEY$(5) = ""

MINKEY(6) = 49: MAXKEY(6) = 54: EXTMINKEY(6) = 59: EXTMAXKEY(6) = 59: SPECIALKEY$(6) = CHR$(8)+CHR$(13)+CHR$(27)+"123456": EXTSPECIALKEY$(6) = ""

MINKEY(7) = 32: MAXKEY(7) = 122: EXTMINKEY(7) = 0: EXTMAXKEY(7) = 0: CAPSON(7) = -1: SPECIALKEY$(7) = CHR$(8)+CHR$(13)+CHR$(27): EXTSPECIALKEY$(7) = "": CAPSON(7) = -1

MINKEY(8) = 0: MAXKEY(8) = 0: EXTMINKEY(8) = 0: EXTMAXKEY(8) = 0: SPECIALKEY$(8) = CHR$(8)+CHR$(13)+CHR$(78)+CHR$(89)+CHR$(110)+CHR$(121): EXTSPECIALKEY$(8) = "": CAPSON(8) = -1

MINKEY(9) = 0: MAXKEY(9) = 0: EXTMINKEY(9) = 0: EXTMAXKEY(9) = 0: SPECIALKEY$(9) = CHR$(8)+CHR$(13)+CHR$(71)+CHR$(76)+CHR$(103)+CHR$(108): EXTSPECIALKEY$(9) = ""

********************************************************************
OPENING COMMENTS
********************************************************************

WILDOAT is designed to predict yield reduction due to wild oat infestation in either wheat or barley. WILDOAT will also allow you to calculate cost vs. return for recommended herbicide application. WILDOAT was developed by Dr. E. H. Vasey, Extension Soils Specialist at North Dakota State University. WILDOAT utilizes data collected by the Weed Science Staff. Refer to current Weed Control Guide (Extension Circular W-253) or current Crop Production Guide for more complete information.

on wild oat control in wheat or barley.

CROP CHOICES ARE:

WHEAT
BARLEY
LOCATE 8,12:PRINT "Enter your choice of crop (by number)"
LOCATE 25,12:PRINT FKEY$;
CALLER = 1: XFLD = 50: YFLD = 8: LNGTH = 2
GOSUB 2630
IF E$ <> "" THEN 495 ELSE 510
C = ASC(E$)
IF C = 59 THEN GOSUB 1775: GOTO 450
IF C = 60 THEN GOTO 1470
CROP = VAL(S$)
ON CROP GOTO 520,555
GOSUB 710
CLS: LOCATE 16,1,0: PRINT "What is your PROJECTED yield of ";CROP$;" in bu/a?";
CALLER = 2: XFLD = POS(O)+1: YFLD = 3: LNGTH = 3
GOSUB 2630
IF E$ <> "" THEN 745 ELSE 760
745 C = ASC(E$)
750 IF C = 59 THEN GOSUB 1915: GOTO 725
755 IF C = 60 THEN 1470
760 YIELD = VAL(S$)
765 LOCATE 5,12:PRINT "What is the number of WILD OATS per square yard"
770 PRINT TAB(12) "(if the number exceeds 160 then use 160)?";
775 CALLER = 2: XFLD = POS(0) + 1: YFLD = 6: LNGTH = 4
780 GOSUB 2630
785 IF E$ <> "" THEN 790 ELSE 805
790 C = ASC(E$)
795 IF C = 59 THEN GOSUB 605: GOTO 765
800 IF C = 60 THEN 1470
805 IF VAL(S$) > 286 THEN NUMBER = 286 ELSE NUMBER = VAL(S$)
810 NUMBER$ = S$
815 PYR% = .0000022*(NUMBER^3)+2.89*SQR(NUMBER) "pyr is percent yield reduction
820 YR = YIELD-(PYR%/100*YIELD) "yr is yield reduction
825 NUMBER$ = S$
830 RETURN
835 "*******************************************************************
840 "PRINT RESULTS OF CALCULATIONS
845 "*******************************************************************
850 CLS: LOCATE 3,12
855 PRINT "An infestation of ";NUMBER$;" wild oats per square yard"
860 PRINT TAB(12) "can reduce your yield by";PYR%;" percent.";PRINT
865 PRINT TAB(12) "Your yield may be reduced from";YIELD;" bu/a"
870 PRINT TAB(12) "to ";PYR%:";PRINT " bu/a unless wild oats are controlled."
875 RETURN
880 "*******************************************************************
885 "HERBICIDE APPLICATION ROUTINE
890 "*******************************************************************
895 LOCATE 25,1:PRINT ST$;:LOCATE 23,6,0
900 PRINT "Do you wish to see a cost vs. return for herbicide application(Y/N)?"
905 CALLER = 8: XFLD = POS(O)+1: YFLD = CSRLIN: LNGTH = 2
910 GOSUB 2720
915 IF S$<"Y" AND S$<"y" THEN 1375
920 CLS
925 PRINT "The recommended herbicides for ";CROP$;" are:
930 PRINT
935 PRINT TAB(15) "APPLICATION" : PRINT TAB(17) "RATES/A" 
940 PRINT TAB(2) "HERBICIDE" TAB(15)"LOW" TAB(22)"HIGH" TAB(31)"COST" 
945 TAB(39)"RATING" TAB(59)"COMMENTS"
950 TAB(2) "--------" TAB(15)"---" TAB(22)"----" TAB(31)"-----" 
955 TAB(39)"--------" TAB(59)"--------"
960 LNE% = 1
965 FOR I = 1 TO NUM%
970 IF LEFT$(FILE$(I,2),LEN(CROP$)) = CROP$ THEN PRINT LNE%;FILE$(I,1) 
975 FILE$(I,3) FILE$(I,4) FILE$(I,5) FILE$(I,6) FILE$(I,7): LNE% = LNE% + 1
980 NEXT I
985 RETURN
990 "*******************************************************************
995 "RATINGS: G = GOOD  F = FAIR  P = POOR  N = NONE  
996 S = SELDOM  O = OFTEN ":COLOR 7,0
997 GOSUB 2400
998 LOCATE 25,12: PRINT FKEY$;
999 LOCATE 15,1:PRINT ST$: LOCATE 15,1:PRINT "2. What is your cost per acre for application of ";HERB$;
990 CALLER = 3: XFLD = POS(0)+1: YFLD = 15: LNGTH = 5
995 GOSUB 2630
1000 IF E$ <> "" THEN 1005 ELSE 1020
1005 C = ASC(E$)
1010 IF C = 59 THEN GOSUB 675: GOTO 985
1015 IF C = 60 THEN 1470
1020 APP = VAL(S$)
1025 LOCATE 15,1:PRINT ST$:LOCATE 15,1:PRINT "3. What will you pay per gallon or per pound for ";HERB$;
1030 CALLER = 3: XFLD = POS(0)+1: YFLD = 15: LNGTH = 6
1035 GOSUB 2630
1040 IF E$ <> "" THEN 1045 ELSE 1060
1045 C = ASC(E$)
1050 IF C = 59 THEN GOSUB 1830: IF PR=0 THEN 1025 ELSE PRICE = PR:GOTO 1065
1055 IF C = 60 THEN 1470
1060 PRICE = VAL(S$)
1065 LOCATE 15,1:PRINT ST$:;LOCATE 15,1:PRINT "4. What rate in pints/A or pounds/A will you apply ";HERB$ (INAPPROPRIATE RATES WILL YIELD FALSE ANALYSIS!);
1070 CALLER = 3: XFLD = POS(0)+1: YFLD = 16: LNGTH = 5
1080 GOSUB 2630
1085 IF E$ <> "" THEN 1090 ELSE 1105
1090 C = ASC(E$)
1095 IF C = 59 THEN GOSUB 1960: GOTO 1115
1100 IF C = 60 THEN 1470
1105 RATE = VAL(S$)
1110 LOCATE 25,1: PRINT ST$;
1115 LOCATE 15,1:PRINT STRING$(160," ");LOCATE 15,1:PRINT "5. What is your expected selling price per bushel for ";CROP$;
1120 CALLER = 3: XFLD = POS(0)+1: YFLD = 15: LNGTH = 5
1125 GOSUB 2630
1130 IF E$ <> "" THEN 1135 ELSE 1150
1135 C = ASC(E$)
1140 IF C = 59 THEN GOSUB 1830: GOTO 1115
1145 IF C = 60 THEN 1470
1150 SELL = VAL(S$)
1155 LOCATE 25,1: PRINT STRING$(79,32);
1165 LOCATE 16,1:PRINT ST$: LOCATE 16,1:PRINT "2. Cost/A for Application: ";PRINT USING "$$:.##";APP
1170 LOCATE 17,1:PRINT ST$:LOCATE 17,1:PRINT "3. Price: ";PRINT USING "$$##.##";PRICE
1175 LOCATE 18,1:PRINT ST$:LOCATE 18,1:PRINT "4. Rate of Application in Pints/A or Pounds/A: ";PRINT USING "##.##";RATE
1180 LOCATE 19,1: PRINT ST$:LOCATE 19,1:PRINT "5. Selling Price:";PRINT USING "$$##.##";SELL
1185 PRINT:COLOR 0,7:PRINT" DATA CORRECT (Y/N)? ";:COLOR 7,0
1190 CALLER = 8: XFLD = POS(0)+1: YFLD = CSLRLIN: LNGTH = 2
1195 GOSUB 2720
1200 IF $S$ = "n" OR S$ = "N" THEN PRINT "Which question number contains the error"; ELSE 1215
1205 INPUT ER:LOCATE 22,1:PRINT ST$: ON ER GOSUB 2175,2200,2235,2265,2295,2325,2355,2385,2415
1210 GOTO 1160
1215 CLS
1220 IF HERBS$ = "FAR-GO 10G" OR LORCS$ = "G" THEN GOSUB 1380 ELSE GOSUB 1405
1225 LOCATE 3,6
PRINT "Your price/A for ",HERB$;" and application is";
PRINT USING "$#####.##";TAL
PRINT: NCR = YR*SELL ' ncr is no control of wildoats expected return
PRINT TAB(6) "Your gross return without control would be: ";
PRINT USING "$#####.##";NCR:PRINT
CR = YIELD * SELL
PRINT TAB(6) "Your gross return with optimum control (100%) would be: ";PRINT USING "$#####.##";CR
PRINT TAB(6) "The return of optimum control above no control is";
PRINT USING "$#####.##";CR-NCR
PRINT TAB(6) "Your investment for control was";PRINT USING "$####.##";(CR-NCR)/TAL;
PRINT " per dollar invested."
PRINT: D = CR-NCR
IF D < TAL THEN 1315
PRINT TAB(6) "Economic analysis indicates that Wild Oat control"
PRINT TAB(6) "would be economical in the short term."
PRINT TAB(6) "Added long term benefits make control even more attractive." GOTO 1335
PRINT TAB(6) "Economic analysis indicates that Wild Oat control would"
PRINT TAB(6) "not be economical in the short term."
PRINT TAB(6) "However added long term benefits may still make control"
PRINT TAB(6) "profitable."
LOCATE 23,10,0:COLOR 0,7:PRINT "Would you like a printout of the compiled results (Y/N)? ":COLOR 7,0
CALLER = 8: XFLD = POS(O)+1: YFLD = CSRLIN: LNGTH = 2
GOSUB 2720
IF S$=''Y'' OR S$="y" THEN GOSUB 2030
LOCATE 23,1:PRINT ST$:LOCATE 23,6,0:PRINT "Would you like to compare cost vs return for another herbicide(Y/N)?";
CALLER = 8: XFLD = POS(O)+1: YFLD = CSRLIN: LNGTH = 2
GOSUB 2720
IF S$ = "y" OR S$ = "y" THEN IF CROP$="BARLEY" THEN 2335 ELSE 920 RETURN
CLS: LOCATE 3,12
PRINT "Would you like to see another prediction (Y/N)?";
CALLER = 8: XFLD = POS(O)+1: YFLD = CSRLIN: LNGTH = 2
GOSUB 2720
CLS: LOCATE 3,12
PRINT "Would you like to see another prediction (Y/N)?";
1475 "******************************************************************
1480 * CALCULATE YIELD REDUCTION FOR BARLEY *
1485 "******************************************************************
1490 LOCATE 3,12: PRINT "What is your projected yield of "; CROP$; " in bu/a";
1495 CALLER = 3: XFLD = POS(0)+1: YFLD = 3: LNGTH = 3
1500 GOSUB 2630
1505 IF E$ <> "" THEN 1510 ELSE 1525
1510 C = ASC(E$)
1515 IF C = 59 THEN GOSUB 1915: GOTO 1490
1520 IF C = 60 THEN 1470
1525 YIELD = VAL(S$)
1530 LOCATE 25,1: PRINT ST$;
1535 LOCATE 5,12: PRINT "Is your "; CROP$; " on fertilized (f) or non-fertilized (nf) soil"
1540 PRINT TAB(I2) "(fertilized consists of adequate rates of Nitrogen"
1545 PRINT TAB(I2) "and Phosphorus)"
1550 CALLER = 4: XFLD = POS(0)+1: YFLD = 7: LNGTH = 3
1555 GOSUB 2630
1560 IF E$ <> "" THEN 1565 ELSE 1580
1565 C = ASC(E$)
1570 IF C = 59 THEN GOSUB 1830: GOTO 1535
1575 IF C = 60 THEN 1470
1580 FERT$ = S$
1585 IF FERT$<> "nf" AND FERT$<> "nf" AND FERT$<> "F" AND FERT$<> "f" THEN BEEP: GOTO 1535
1590 LOCATE 25,12: PRINT FKEY$;
1595 IF FERT$="NF" OR FERT$="nf" THEN GOSUB 1700 ELSE GOSUB 1610
1600 GOSUB 835
1605 RETURN
1610 "******************************************************************
1615 * YIELD REDUCTION ON FERTILIZED SOILS *
1620 "******************************************************************
1625 LOCATE 9,12: PRINT "What is the number of wild oat plants per square yard"
1630 PRINT TAB(I2) "(if the number exceeds 250 then use 250)"
1635 CALLER = 2: XFLD = POS(0)+1: YFLD = CSRLIN: LNGTH = 4
1640 GOSUB 2630
1645 IF E$ <> "" THEN 1650 ELSE 1665
1650 C = ASC(E$)
1655 IF C = 59 THEN GOSUB 605: GOTO 1625
1660 IF C = 60 THEN 1470
1665 NUMBERS = S$
1670 O=VAL(NUMBERS)^3 " # wild oats cubed
1675 W=VAL(NUMBERS)*VAL(NUMBERS)
1680 A=.0023244 * W: B=-7.24E-06 * O
1685 PYR% = A + B
1690 YR = YIELD - (PYR%/100 * YIELD)
1695 RETURN
1700 "******************************************************************
1705 * YIELD REDUCTION ON NON-FERTILIZED SOILS *
1710 "******************************************************************
1715 LOCATE 9,12: PRINT "What is the number of wild oat plants per square yard"
1720 PRINT TAB(12) "(if the number exceeds 250 then use 250)"
1725 CALLER = 2: XFLD = POS(0)+1: YFLD = CSRLIN: LNGTH = 4
1730 GOSUB 2630
1735 IF E$ <> "" THEN 1740 ELSE 1755
1740 C = ASC(E$)
1745 IF C = 59 THEN GOSUB 605: GOTO 1715
1750 IF C = 60 THEN 1470
1755 NUMBER$ = S$
1760 PYRZ = 2.95573 * (SQR(VA(L(NUMBER$)))
1765 YR = YIELD - (PYRZ/100 * YIELD)
1770 RETURN
1775 "******************************************************************
1780 * HELP FOR CROP SELECTION
1785 "******************************************************************
1790 CLS: LOCATE 3,12:PRINT "You are currently limited to either Wheat or
1795 PRINT Barley."
1800 LOCATE 25,12: PRINT FKEY$;: RETURN
1805 A$ = INKEY$: IF A$ = "" THEN 1805
1810 LOCATE 17,1:PRINT "Do you need to calculate a per gallon or per
1815 PRINT pound price(Y/N)?": CALLER = 8: XFLD = POS(O)+1: YFLD = CSRLIN: LNGTH = 2
1820 "******************************************************************
1825 * HELP FOR PRICE/GAL OR PRICE/POUND
1830 LOCATE 17,1:PRINT "The above table provides recommended
1835 PRINT prices/gallon/lb ": COLOR 7,0: FOR J% = 1 TO 3000: NEXT J%:LOCATE 17,1:
1840 PRINT ST$;:LOCATE 17,5:PRINT "What size is the container you will use
1845 PRINT (i.e. 5 gal, 30 gal, 100 lb)?": CALLER = 2: XFLD = POS(O)+1: YFLD = CSRLIN: LNGTH = 4
1850 PRINT CALLER = 3: XFLD = POS(O)+1: YFLD = CSRLIN: LNGTH = 8
1855 PRINT PRINT ST$;:PRCE = VAL(S$)
1860 PRINT PR = PRCE/SIZE
1865 LOCATE 17,1:PRINT "The price is": PRINT USING "$$$#.##":PR; PRINT " and will be automatically placed in the program"
1870 FOR J% = 1 TO 3000: NEXT J%
1875 LOCATE 17,1:PRINT ST$;:LOCATE 17,5:PRINT "Yield estimates can be your own estimates
1880 PRINT based on"
1885 PRINT "experience or they can be based on variety performance
1890 PRINT data from branch"
1895 PRINT "experiment stations. They can also be based on soil
1895 PRINT survey reports."
1900 LOCATE 25,12: PRINT FKEY$;: RETURN
1905 "******************************************************************
1910 * HELP FOR PROJECTED YIELD
1915 "******************************************************************
1920 "******************************************************************
HELP FOR RATE/A OR POUND/A

LOCATE 18,12,0: PRINT "RATES ARE BASED on broadcast application and are "
PRINT TAB(7) "expressed as active ingredient or acid equivalent, and as the"
PRINT TAB(7) "amount of commercial product. Commercial formulations of the"
PRINT TAB(7) "same herbicide may vary in their amount of active ingredient."
PRINT TAB(7) "The table above provides recommended low/high application rates/A."

FOR J% = 1 TO 10000: NEXT J%
LOCATE 18,1: FOR J% = 1 TO 5: PRINT ST$: NEXT
RETURN

PRINT SUBROUTINE

LPRINT CHR$(27);CHR$(53)
IF CROP$="BARLEY" THEN IF FERT$="F" OR FERT$="f" THEN LPRINT CHR$(14);"FERTILIZED "; ELSE LPRINT CHR$(14); " NON-FERTILIZED ";
LPRINT CHR$(14);" GUIDELINES"
LPRINT:LPRINT "Projected yield:";YIELD;TAB(40) "Wild Oats/sq yard:";NUMBER$;
LPRINT:LPRINT "Yield with no control:";:LPRINT USING"###.###";YR
LPRINT:LPRINT CHR$(14);"Herbicide: ";HERB$
LPRINT: LPRINT "Cost/A for Application:";:LPRINT USING "####.####";APP
LPRINT:LPRINT "Rate of Application(units/A):";:LPRINT USING "$###.###",RATE
LPRINT:LPRINT "Expected market price:";:LPRINT USING "####.####";SELL:LPRINT
LPRINT "Price/A and application:";:LPRINT USING "####.####";TAL:LPRINT
LPRINT "Gross return without control:";:LPRINT USING "####.####";NCR:LPRINT
LPRINT "Gross return with optimum control:";:LPRINT USING "####.####";CR:LPRINT
LPRINT "Return of optimum control above no control is:";:LPRINT USING "####.####";CR-NCR
IF D <TAL THEN 2135
LPRINT: LPRINT "Economic analysis indicates that Wild Oat control would"
LPRINT "be economical in the short term."
LPRINT "Added long term benefits make control even more attractive."
GOTO 2150
LPRINT:LPRINT "Economic analysis indicates that Wild Oat control would"
LPRINT "NOT be economical in the short term."
LPRINT "However added long term benefits may still make control profitable."
LPRINT CHRS$(12)
RETURN

CORRECT INPUT DATA ROUTINE FOR LINES 1300-1440

LOCATE 22,1:GOSUB 2435
LOCATE 22,1: PRINT ST$
2190 RETURN
2195 ' get correct cost/A for application
2200 LOCATE 22,1:PRINT "What is your cost per acre for application";
2205 CALLER = 3: XFLD = POS(0)+1: YFLD = CSRLIN: LNGTH = 5
2210 GOSUB 2630
2215 APP = VAL($$)
2220 LOCATE 22,1 : PRINT ST$
2225 RETURN
2230 ' get correct price/gal or price/lb
2235 LOCATE 22,1:PRINT "What will you pay per unit of measure for ";HERBS;
2240 CALLER = 3: XFLD = POS(0)+1: YFLD = CSRLIN: LNGTH = 6
2245 GOSUB 2630
2250 PRICE = VAL($$)
2255 LOCATE 22,1: PRINT ST$
2260 RETURN
2265 LOCATE 22,1:PRINT "What rate in units/A will you apply(INACCURACY
MEANS FALSE RESULTS)";
2270 ' get the correct application rate
2275 CALLER = 3: XFLD = POS(0)+1: YFLD = CSRLIN: LNGTH = 5
2280 GOSUB 2630
2285 RATE = VAL($$)
2290 LOCATE 22,1: PRINT ST$
2295 RETURN
2300 ' get the correct expected selling price
2305 LOCATE 22,1:SELL=0:PRINT "What is your expected selling price per
bushel for ";CROP$;
2310 CALLER = 3: XFLD = POS(0)+1: YFLD = CSRLIN: LNGTH = 5
2315 GOSUB 2630
2320 SELL = VAL($$)
2325 LOCATE 22,1: PRINT STRING$(79,"")
2330 RETURN
2335 "********************************************************************************
2340 ' REVERSE STATED FERTILIZATION
2345 "********************************************************************************
2350 CLS:LOCATE 3,6:PRINT "Your present calculations have been on ";
2355 IF FERT$="f" OR FERT$="F" THEN PRINT "fertilized" ELSE PRINT
"non-fertilized"
2360 PRINT TAB(6) "soil. Do you wish to continue with the present
option(y/n)?";
2365 CALLER = 8: XFLD = POS(0)+1: YFLD = CSRLIN: LNGTH = 2
2370 GOSUB 2720
2375 IF $S="y" OR $$="y" THEN 2395
2380 IF FERT$="f" OR FERT$="F" THEN GOSUB 1760 ELSE GOSUB 1670
2385 IF FERT$="f" OR FERT$="F" THEN FERT$="nf" ELSE FERT$="F"
2390 GOSUB 835
2395 GOTO 895
2400 "********************************************************************************
2405 ' HERBICIDE SELECTION ROUTINE
2410 ' Lets the user chose a herbicide by number and sets herb$ to the
2415 ' correct herbicide name.
2420 "********************************************************************************
2425 LOCATE 15,1:PRINT ST$:LOCATE 25,12:PRINT "[F1] Own herbicide";
2430 LOCATE 15,1:PRINT "1. ";
2435 PRINT "Choose by number the herbicide you will apply([F1] for own)";
2440 IF CROPS$ = "BARLEY" THEN 2505
2445 CALLER = 5: XFLD = POS(0)+1: YFLD = CSRLIN: LNGTH = 2
2450 GOSUB 2630
2455 IF E$ <> "" THEN 2460 ELSE 2470
2460 C = ASC(E$)
2465 IF C = 59 THEN GOTO 2475
2466 HN = VAL(S$)
2467 IF HN = 1 THEN HERB$ = "AVENGE"
2468 IF HN = 2 THEN HERB$ = "CARBYNE"
2469 IF HN = 3 THEN HERB$ = "FAR-GO 10G"
2470 IF HN = 4 THEN HERB$ = "FAR-GO 4L"
2471 IF HN = 5 THEN HERB$ = "HOELON"
2472 GOTO 2570
2473 HERB" = HERB$.
2474 RETURN
2475 ' hericides for barley
2476 CALLER = 6: XFLD = POS(O)+1: YFLD = CSRLIN: LNGTH = 2
2477 GOSUB 2630
2478 IF E$ <> "" THEN 2483 ELSE 2493
2479 C = ASC(E$)
2480 IF C = 59 THEN GOTO 2485
2481 HN = VAL(S$)
2482 IF HN = 1 THEN HERB$ = "AVADEX(L)"
2483 IF HN = 2 THEN HERB$ = "AVENGE"
2484 IF HN = 3 THEN HERB$ = "CARBYNE"
2485 IF HN = 4 THEN HERB$ = "FAR-GO 10G"
2486 IF HN = 5 THEN HERB$ = "FAR-GO 4L"
2487 IF HN = 6 THEN HERB$ = "HOELON"
2488 RETURN
2489 ' allow user input own herbicide
2490 LOCATE 25,1: PRINT ST$;:LOCATE 15,1:PRINT ST$;:LOCATE 15,5:PRINT "What is the name of the herbicide you will use?";
2491 CALLER = 7: XFLD = POS(O)+1: YFLD = CSRLIN: LNGTH = 16
2492 GOSUB 2630
2493 HERB$ = S$
2494 LOCATE 17,5:PRINT "Is the herbicide liquid(L) or granular(G)?";
2495 CALLER = 9: XFLD = POS(O)+1: YFLD = CSRLIN: LNGTH = 2
2496 GOSUB 2630
2497 LORG$ = S$
2498 LOCATE 17,1: PRINT STRING$(75,32)
2499 GOTO 2570
2500 GOTO 2570
2501 ' screenin routine
2502 ' taken from 'Advanced Basic and Beyond' by Dr. L. Goldstein
2503 ' this routine inputs data as a string S$
2504 ' It allows input to have the following parameters:
2505 ' LNGTH = maximum length of input string
2506 'XF LD = cursor column for beginning of input string
2507 'YFLD = cursor row for input field
2508 'FLDBEG = first character position in field
2509 'FLDEND = last character position in field
2510 'S$ = contents of the field from beginning up to space before cursor
2511 'T$ = contents of the field from the cursor to the end of the field
2512 ' At the end of the routine, the contents of the field are returned in S$
2513 ' LASTPOS = position currently occupied by last character
2514 ' If a key with an extended ASCII code is pressed, it ends processing the
2515 ' current field
2516 ' The contents of the field are returned in S$, the second byte of the
2517 ' extended ASCII code in E$.
2518 ' CSR = the current column of the cursor
2519 '------------------> main routine
2725 \texttt{S$ = "": E$ = "": INPUTEND = FALSE: KEYHIT = FALSE}
2730 \texttt{FLDEND = XFLD + (LNGTH-1)}
2735 \texttt{CSR = XFLD}
2740 \texttt{GOSUB 3060} \quad \text{--------- compute initial lastpos}
2745 \texttt{LOCATE YFLD, XFLD: COLOR 0,7:PRINT SPC(LNGTH-1):COLOR 7,0:LOCATE YFLD,XFLD}
2750 \texttt{WHILE INPUTEND = FALSE}
2755 \texttt{GOSUB 3140} \quad \text{--------- input character}
2760 \texttt{IF EXTENDED = TRUE THEN}
2765 \texttt{WEND}
2770 \texttt{J$ = (XFLD+LNGTH) - LASTPOS}
2775 \texttt{PRINT STRING$(J%,32)}
2780 \texttt{GOSUB 2980} \quad \text{-----------> read screen}
2785 \texttt{S$ = S$ + T$}
2790 \texttt{RETURN}
2795 \texttt{'---------- begin subroutines <----------}
2800 \texttt{'---------------------------------- handle ordinary ASCII codes}
2805 \texttt{KEYHIT = TRUE}
2810 \texttt{IF C$ = CHR$(8) THEN 2870} \quad \text{Backspace}
2815 \texttt{IF C$ = CHR$(13) THEN 2905} \quad \text{Enter}
2820 \texttt{IF C$ = CHR$(27) THEN 2920} \quad \text{Esc}
2825 \texttt{IF C$ >= CHR$(32) THEN GOTO 2950} \quad \text{handle displayable character}
2830 \texttt{'---------------------------------- handle extended ASCII codes}
2835 \texttt{E$ = C$}
2840 \texttt{INPUTEND = TRUE}
2845 \texttt{GOTO 2765}
2850 \texttt{'---------------------------- reject character}
2855 \texttt{BEEP}
2860 \texttt{GOTO 2765}
2865 \texttt{'---------------------------- handle backspace}
2870 \texttt{IF LASTPOS < XFLD THEN 2855}
2875 \texttt{GOSUB 2980}
2880 \texttt{IF CSR <> XFLD THEN CSR = CSR-1:PRINT CHR$(219);}
2885 \texttt{LOCATE YFLD,CSR:PRINT CHR$(219);:LOCATE YFLD,CSR}
2890 \texttt{LASTPOS = LASTPOS-1}
2895 \texttt{GOTO 2765}
2900 \texttt{'---------------------------- handle enter}
2905 \texttt{INPUTEND = TRUE}
2910 \texttt{GOTO 2765}
2915 \texttt{'---------------------------- handle esc}
2920 \texttt{LOCATE YFLD,XFLD}
2925 \texttt{PRINT STRING$(LNGTH,32);}
2930 \texttt{LASTPOS = 0: CSR = XFLD}
2935 \texttt{LOCATE YFLD, XFLD:COLOR 0,7:PRINT SPC(LNGTH-1):COLOR 7,0:LOCATE YFLD,XFLD}
2940 \texttt{GOTO 2765}
2945 \texttt{'---------------------------- display character}
2950 \texttt{PRINT C$;}
2955 \texttt{IF LASTPOS < CSR THEN LASTPOS = CSR}
2960 \texttt{IF CSR = FLDEND THEN BEEP}
2965 \texttt{IF CSR = FLDEND THEN PRINT CHR$(29); CHR$(32); CHR$(32); ELSE CSR = CSR + 1}
2970 \texttt{GOTO 2765}
2975 \texttt{'---------------------------- read field from screen}
2980 \texttt{LOCATE,,0}
2985 \texttt{S$ = "": T$ = ""}
2990 \texttt{IF LASTPOS = 0 THEN 3030}
2995 \texttt{FOR J$ = XFLD TO CSR-1}
3000 \texttt{S$ = S$ + CHR$(SCREEN(YFLD,J$))}
3005 NEXT J
3010 FOR J = CSR TO LASTPOS
3015 T$ = T$ + CHR$(SCREEN(YFLD,J))
3020 NEXT J
3025 LOCATE,,1
3030 RETURN
3035 '------------- erase field
3040 LOCATE YFLD, XFLD: CSR = XFLD: LASTPOS = 0
3045 PRINT STRINGS(LNGTH,32);
3050 LOCATE YFLD, XFLD
3055 RETURN
3060 '------------- compute lastpos
3065 LASTPOS = FLDEnd: CSR = XFLD
3070 GOSUB 2980
3075 WHILE RIGHT$(T$,1) = CHR$(32)
3080 T$ = LEFT$(T$,LEN(T$)-1)
3085 LASTPOS = LASTPOS -1
3090 WEND
3095 RETURN
3100 '------------- clear keyboard buffer
3105 DEF SEG = 0: POKE 1050,PEEK(1052)
3110 DEF SEG
3115 RETURN
3120 '------------- end routines
3125 '------------------ keyin
3130 'This routine reads a character from the keyboard and accepts or
3135 'rejects it based on the caller's specifications
3140 '------------- input character string from inkey$
3145 C$ = INKEY$
3150 IF C$ = "" THEN 3145
3155 C = ASC(C$)
3160 IF LEN(C$) = 2 THEN EXTENDED = TRUE ELSE EXTENDED = FALSE
3165 IF EXTENDED = FALSE THEN 3195
3170 C$ = RIGHT$(C$,1)
3175 C = ASC(C$)
3180 GOTO 3250
3185 '------------- ordinary ASCII codes
3190 '----- test for range
3195 IF C >= MINKEY(CALLER) AND C <= MAXKEY(CALLER) THEN 3220
3200 '------ handle special characters
3205 IF SPECIALKEY$(CALLER) = "" THEN 3280
3210 IF INSTR(SPECIALKEY$(CALLER),C$) = 0 THEN 3280
3215 '------- convert to capitals if necessary
3220 IF CAPSON(CALLER) = FALSE THEN 3290
3225 IF C > 96 AND C < 123 THEN C = C-32
3230 C$ = CHR$(C)
3235 GOTO 3290
3240 '-------- extended ASCII codes
3245 '----- test for range
3250 IF C >= EXTMINKEY(CALLER) AND C <= EXTMAXKEY(CALLER) THEN 3290
3255 '-------- handle special characters
3260 IF EXTSPECIALKEY$(CALLER) = "" THEN 3280
3265 IF INSTR(EXTSPECIALKEY$(CALLER),C$) = 0 THEN 3280
3270 GOTO 3290
3275 '---------- illegal character
3280 BEEP
3285 GOTO 3145
3290 RETURN
3295 '--------------> error trapping
3300 IF ERR = 25 THEN 3310 ELSE 3330
3305 '--------------> print message printer not on
3310 CLS: LOCATE 3,20: PRINT "Your printer is not on!"
3315 PRINT TAB(10) "Make sure to align your forms to top-of-page"
3320 FOR I% = 1 TO 5000: NEXT I% :CLS:RESUME 1225
3325 '--------------> print unrecoverable error message
3330 CLS: LOCATE 3,10: PRINT "An error has occurred in the program that is not"
3335 PRINT TAB(10) "recoverable. Type 'RUN' to restart the program."
3340 CLS: END