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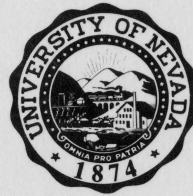
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UNIVERSITY OF NEVADA, RENO

A MANUAL FOR USING RIBPRO,
COMPUTER RANGE IMPROVEMENT BUDGET PROGRAM FOR NEVADA
FIRST EDITION

.S. 135

May 1981

GIANNINI FOUNDATION OF
AGRICULTURAL ECONOMICS

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Program Introduction

The purpose of this publication is to provide an instruction manual for use of a computer program called RIBPRO. RIBPRO is an acronym for Range Improvement Budget PROgram. This computer program, written in BASIC and presented in Appendix D, calculates an internal rate of return to dollars invested by a private or public entity in range improvement. RIBPRO is written for Nevada conditions, but it can be adapted to other states with minor modifications.

Internal rate of return (sometimes called "yield of an investment" or "marginal efficiency of capital") can be defined as the discount rate which equates present value of project costs to present value of project benefits. Alternatively, it is the discount rate which equates the present value of net returns (benefits minus costs) to zero. For an investment to be desirable, the calculated internal rate of return must be equal to or greater than the interest on borrowed money used in the investment or the internal rate of return from projects of similar length of life and risk. The appropriate value for comparison in this program is the one entitled "your expected internal rate of return adjusted for your expected inflation rate." In other words, it is assumed range improvement costs and benefits will increase over time at a rate equal to the user's expected rate of inflation.

In this program, range improvement includes sagebrush removal, crested wheatgrass seeding, and maintenance of the crested wheatgrass stand over time. Sagebrush removal and grass improvement alternatives include spray and seed, plow and seed, and spray only. Spraying herbicide to kill sagebrush may be accomplished using aerial spraying or ground spraying. Additional fencing and water development for grazing cattle are also

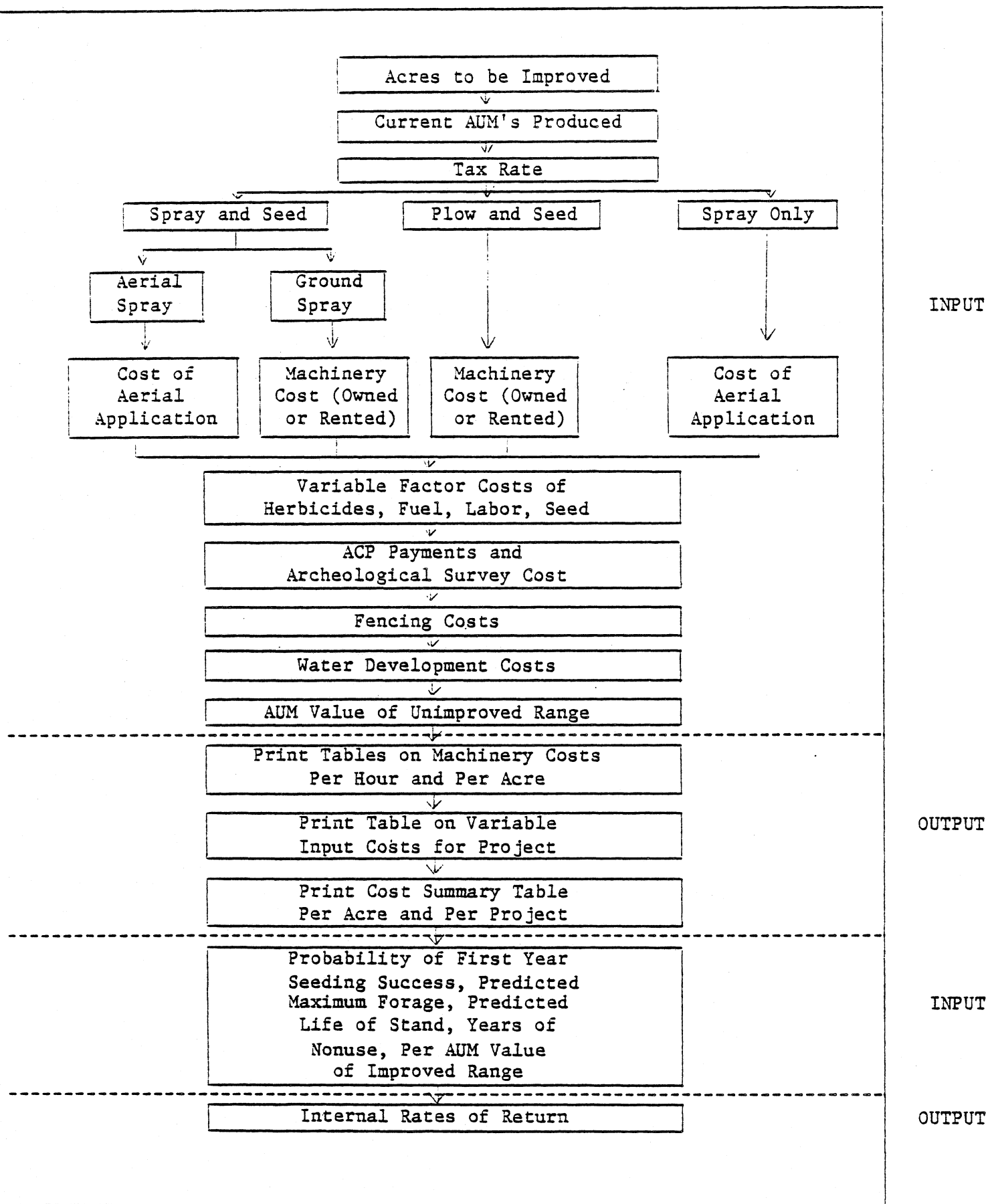
included as optional management activities. To calculate costs and returns of all range improvement activities anticipated by the user, detailed information must be provided by the user. A minimum number of assumptions are incorporated into RIBPRO. For example, current production in AUM's (animal unit months) on the acreage to be improved must be estimated by user, in addition to the AUM's expected following the improvement project. If equipment to be used is owned, then information must be provided on current market value, average annual hours of use, average annual maintenance and repair costs, proportion of life remaining, per hour fuel use during operation, per unit cost of fuel, and acres covered per hour for a given activity. A summary list of information a user must provide is given in Appendix A.

One possible use of this manual is by university extension personnel working with ranchers or other individuals considering range improvements on private or public lands. It is not anticipated that both the individual (user) considering the range investment and the extension person will be familiar with this manual. This publication is intended primarily for the person who will be sitting at the computer terminal and typing in the appropriate user information.

Program Description

A general description of RIBPRO is provided in Figure 1. The user must provide all information labeled "INPUT". All input quantities are based on the particular user situation. The three improvement alternatives and the two spray and seed alternatives are given in the program. The sequence of RIBPRO questions and responses are also illustrated in Figure 1. Questions regarding costs are asked before income related questions, with the exception of Federal ACP payments.

FIGURE 1. SCHEMATIC OF RIBPRO



Four cost tables are printed. Information provided includes average machine fixed costs per hour and per acre, average repair costs per treated acre, other input costs per acre and for the entire project, and a budget cost summary. Examples are shown in Appendix C.

Two internal rate of return values are calculated under three alternative assumptions: (1) successful initial seeding first year, (2) initial seeding failure with success on the second year, and (3) an expected internal rate of return given user's expected probability of initial seeding failure. The second internal rate of return is adjusted for expected inflation over project life. This is the appropriate rate to use when making comparisons with the interest rate on funds borrowed for the project or when making comparisons with interest rates of return from similar investment alternatives.

Input Section

In Appendix B, RIBPRO questions to be answered by the user are listed. The program begins with the question, "How many acres are to be improved?" This value is the number of acres of one type of range improvement in one year. For example, a rancher or other user may improve 800 total acres but 300 acres may be plowed and seeded while 500 acres may be sprayed and seeded. RIBPRO can accomodate only one improvement technique at a time. Thus, two program "runs" are to be made for this user, one for 300 acres of plow and seed and one for 500 acres of spray and seed.

Second question asks, "How many acres of unimproved range are currently used to support one cow for one month (how many acres per AUM)?" Program user estimates the range's carrying capacity (perhaps on an historical basis) and this number is entered. If figures are available for similar range types nearby, these can serve as a proxy for user's range

capacity. For example, if 100 cows can forage on 10,000 acres of range for 5 months each year without damaging the range, carrying capacity can be estimated to be 20 acres per AUM ($100 \text{ cows} \times 5 \text{ months} = 500 \text{ AUM's}$; $10,000 \text{ acres} \div 500 \text{ AUMs} = 20 \text{ acres/AUM}$). Enter 20 in response to this question.

The third question asks, "What is the local property tax rate as it applies to the equipment owned by the user?" This value is entered as a percent. When converted to a decimal, this is the rate which is multiplied times the assessed value to determine annual property taxes. In the program, machinery taxes are calculated as user's estimated current machine value times .35, times the entered percentage tax rate, divided by 100. In Nevada, such property is placed on the rolls at an assessed value which is 35 percent of full cash value. For example, if a user pays \$3.64 per \$100 assessed valuation, enter 3.64.

The fourth question asks the user to choose one of three range improvement technologies: 1) spray and seed, 2) plow and seed, and 3) spray only. For example, if user is contemplating spraying sagebrush with 2,4-D and seeding to crested wheatgrass, number 1) is chosen, which is the spray and seed option. Enter the number 1 in response to this question.

When a technology has been chosen in the fourth question, RIBPRO branches to the section of the program which applies to the technology chosen. Questions relevant to that technology are asked. These questions are discussed in the following three sections.

Option 1. Spray and Seed

First question in this option is, "Will ground or aerial spraying be accomplished?" If user decides to use a ground sprayer, enter the number

1, which corresponds to ground spraying. If user chooses aerial spraying of weeds and brush, enter the number 2 as it corresponds to aerial spraying.

Aerial Spraying

If aerial spraying is chosen, RIBPRO's next question is, "Enter the estimated cost per acre for aerial spraying?" This cost should not include cost of herbicide, which is accounted for separately. For example, if user has an estimate from an aerial spraying company of \$4.24 per acre, excluding herbicide, enter 4.24 in response to this question. No dollar signs are necessary or allowed by the computer.

Ground Spraying

Spraying Equipment

If ground spraying is chosen, the program's next question is, "Enter the current value of the tractor to be used to spray?" This question is followed by a similar question asking current market value of the sprayer. These values should reflect user's estimate of present value of the machines. For example, if user believes a tractor is worth \$16,500 today enter 16500 (with no commas) in response to current value of user tractor question. If a comma is typed in, the computer replies, "Too Much Data" and allows data to be retyped correctly with no commas.

Next question, "What proportion of tractor life remains?" asks for an estimate of percentage of useful tractor life which remains. For example, if user believes the machine is 40 percent used up, then 60 percent of its total life remains. Enter 0.60 in response to this question.

Next question asks for estimated hours of annual tractor use. For example, user estimates total hours of tractor operation in a given year is

435 hours. Enter 435 in response to this question.

Next two questions (fifth and sixth in the series) concern the sprayer and follow the same format as outlined above for the tractor.

Seventh and eighth questions in this section ask for estimated average annual repair and maintenance costs for tractor and sprayer. Because repair costs vary greatly from year to year, an "average" estimate may be the best response obtainable. One possible method of establishing this value is to have user estimate a total cost of repairs for depreciable machine life and divide this value by total number of years in depreciation period.

Seeding Equipment

Next question asks whether the same tractor will be used to seed the range. If the same tractor will be used, enter the number 1. If a different tractor will be used, enter the number 0. If a different tractor will be used, the program asks the same series of questions that were asked concerning spraying tractor (value, life, hours of use, repairs). After these four questions have been answered, RIBPRO will then be at the same point as if the program had been told the same tractor will be used to seed.

At this point, the program inquires if user owns a rangeland drill. If the answer is no, type the number 0 and the following question is, "Enter the rental or lease cost per period of use for the rangeland drill?" Enter cost of renting or leasing drill for time period given. If user borrows drill from an agency, add all costs involved in acquiring drill for use (transporting, repairing, etc.) and enter total amount. For example, if a drill is borrowed for two weeks from BLM and it costs user \$800 for transport to and from BLM yard and \$100 for repairs to drill, enter 900 in

response to this question.

If user owns a rangeland drill and the number 1 is typed in response to the question of owning drill, RIBPRO asks the series of four questions (values, life, use, repairs) in a manner similar to spraying tractor.

The program now begins inquiring about variable inputs of spray and seed improvement program. First question is, "How many acres per hour can be sprayed?" For example, if five acres per hour can be sprayed, enter the number 5 in response to the question.

Second input related question asks spraying tractor's fuel use per hour. For example, if the tractor uses 3.3 gallons of diesel fuel per hour, enter the number 3.3 in response to the question.

The third input question asks fuel cost per gallon for this tractor's fuel type. If fuel costs \$1.05 per gallon, enter 1.05 in response to this question.

Fourth input related question inquires as to number of herbicides which will be applied. RIBPRO will not allow more than two herbicides to be applied in any given program "run". Therefore, type in either 1 or 2 in response to this question.

Herbicides

One herbicide. If one herbicide will be used, the program asks cost per unit of herbicide. Type in cost per pound or gallon which was paid or is expected to be paid for the chemical (include delivery fees if any). For example, if 2,4-D costs \$1.89 per pound, enter 1.89 in response to this question.

The next question asks for number of units of herbicide to be applied per acre. If 2.8 pounds of 2,4-D will be applied, enter 2.8 in response to this question.

Two herbicides. If two herbicides will be applied (e.g., 2,4-D

followed by atrazine) the program asks the same three questions as above for herbicides one and two.

Spray Labor

Next two questions deal with labor used for spraying. First question asks for cost per hour of labor used to spray. If this value is, for example, \$4.10 per hour, enter 4.10 in response to the question.

Second labor question asks for total labor hours to spray entire acreage considered. This figure should include time spent traveling to and from range site and loading sprayer tank as well as actual operation of tractor. For example, if user estimates 100 man hours to spray 400 acres, enter 100 in response to the question.

Variable Inputs - Seeding

RIBPRO now asks a series of questions dealing with variable inputs for seeding rangeland. First question asks, "How many acres per hour can be seeded?" This should be answered in the same manner as for spraying. If six acres per hour can be seeded, enter the number 6 in response to the question.

If tractor used to spray is not used to seed, the program asks for seeding tractor's fuel use per hour. If tractor uses 2.9 gallons of gasoline per hour, enter 2.9 in response to the question. Next, RIBPRO asks for cost of fuel per gallon. If this is \$1.07, enter 1.07 in response. These two questions are not asked if the spray tractor is also used to seed, in the case of spray and seed.

Next, RIBPRO asks, "How many pounds of seed will be applied per acre?" This will vary with equipment used. A standard rangeland drill may

apply six pounds per acre, but with modified openers may apply three pounds per acre. Enter value corresponding to amount that will be applied. The program then asks cost per pound of the seed which will be applied. Enter this cost in response to the question.

RIBPRO now asks two labor questions: 1) cost per hour per labor utilized to seed and 2) total labor hours to seed improvement acreage. These two questions are handled in a manner similar to that in the spraying section. RIBPRO now goes to input section concerning other costs.

Option 2. Plow and Seed

Plowing Tractor

Initial question in this option asks if user owns tractor to be used for range plowing. This question appears because in many cases, a large crawler-type tractor is preferred to pull a rangeland plow over rough rangeland terrain. Some potential users do not own this expensive and specialized tractor. Type the number 1 if the user owns this tractor or the number 0 if the tractor is not owned.

If 0 is typed, indicating user does not own plowing tractor, the program asks for total rental or lease cost per period of use. This question assumes user rents tractor for only period of time used to complete the range plowing project. For example, if user will rent a D-6 caterpillar for two weeks at a cost of \$850, enter 850 in response to this question. See previous section on renting the rangeland drill for figuring the cost of renting a machine.

If the number 1 is typed, indicating user owns plowing tractor, a series of four questions are then posed. First question asks for current value of tractor to be used to plow. This value should reflect user's

estimate of tractor's current market value. For example, if user estimates tractor is worth \$98,000 today, type 98000 in response to this question.

Second tractor question asks for proportion (percentage) of tractor life remaining. For example, if a user says a "D-6 Cat" is 60 percent used up, then 40 percent of the machine's life remains. Enter 40 in response to this question. Third plow tractor question asks for estimated hours of total annual use of tractor. For example, user estimates total hours of machine use in a given year is 450 (this can be an average). Enter this value of 450 in response to this question.

Fourth plow tractor question asks for average annual maintenance and repair costs for tractor. One method of establishing this value is to have user estimate total repair costs in depreciable life of tractor and divide by total number of years in the depreciation period for tractor.

Rangeland Plow

First rangeland plow question asks if user owns the rangeland plow. Yes is signified by typing the number 1, while no is signified by typing the number 0. If 0 is typed in response to this question, RIBPRO will then ask the rental or lease cost per period of use. Enter total cost for renting, leasing, or borrowing a rangeland plow for the time period it will be utilized. For example, if it costs \$500 to rent a rangeland plow for a week, enter 500. This figure includes all expenses incurred in obtaining a plow (transport, repair, etc.).

If the rangeland plow is owned, RIBPRO will ask a series of four questions similar to those asked if plowing tractor is owned. These include, 1) value of plow, 2) proportion of life remaining, 3) hours of annual use, and 4) maintenance and repair costs. After these questions

have been answered, the program skips to seeding machinery section where questions concerning equipment used to seed are asked. Refer to section on seeding for these questions and accompanying explanation. After seeding machinery questions have been asked, the program will skip to variable inputs of plowing section.

Variable Inputs of Plowing

First question in this section of the program concerns how many acres can be plowed in one hour. For example, if a user can plow an average of two acres of range in one hour, enter the number 2 in response to this question.

Second question asks for plowing tractor's fuel use per hour. for example, if a D-6 crawler tractor consuming 8.5 gallons of diesel fuel per hour is to be used, enter 8.5 in response to this question.

Third question relates to second question and asks for fuel cost per gallon. If diesel costs \$1.02 per gallon, enter 1.02 in reply to this question.

Fourth question asks cost per hour of labor used for plowing. If an equipment operator is paid \$4.25 an hour, enter 4.25 in reply to this question. It should be noted here that even if user operates equipment, a value is placed on labor time, the same as if someone else were doing the job.

Final question of this section asks for total labor hours to plow the entire acreage considered. This figure includes time used for travel to and from plowing site, refueling, and any other activity involved in plowing as well as time spent actually operating equipment. For example, if it takes 100 man hours to plow 85 acres of range improvement, enter 100 in response to this question.

The program will now begin asking questions related to variable costs of seeding range. Refer to seeding variable cost section.

Option 3. Spray Only

This option is similar to Option 1 with the exception that no questions relating to seeding are asked. Refer to spraying section in Option 1 for details.

General Questions for All Options

These questions are asked for all improvement options. First question asks if user expects to receive federal ACP (Agricultural Conservation Program) payments. For example, if a user expects to receive federal money to help pay for improving range (private or public), type the number 1, if not, type the number 0. If a user receives federal dollars, additional federal legal restrictions may apply. One current legal requirement is an archaeological and cultural survey performed at user expense. Of course, if the survey will cost more than the amount of federal money the user will receive, the user would probably choose not to accept federal money.

If user chooses to receive federal ACP payments, RIBPRO then asks per acre cost of archaeological and cultural surveys. This cost currently ranges between \$1 and \$5 per acre. Federal ACP payments are presently limited to a maximum of \$3500 per person per year, or one-half of a user's investment cost up to the \$3500 maximum.

Next question RIBPRO asks concerns whether additional fencing such as cross fences will be used to isolate treated acreage. A cross fence might be used, for instance, if a field is being cut in half. The cross fence

will help prevent livestock from destroying new seedlings. If more such fencing is anticipated, type the number 1. If no more fencing will be used, type the number 0.

If the answer to the previous question is yes, the program asks, "How many miles of fencing will be built?" Table 1 on the following page gives miles of fence to enclose selected acreages of square configurations. Also provided are estimates of length of cross fencing for certain acreages. For example, if a one-half mile cross fence is used, enter 50 in response to this query. If the answer to the previous question is no, the program skips to the water development question.

Next fencing related question (if yes was the response to the initial fencing question) asks for estimated per mile cost for erecting fence. For example, if two miles of electric fence are erected at a cost of \$2400, per mile cost would be \$1200. Enter 1200 in response to this question.

Final fencing question asks for an estimated per mile cost for annual general fence maintenance. This may be a difficult question for a user to answer. Some fence is repaired on an irregular basis, for example, when fences are broken. An estimate of labor, fuel, and material costs for this activity should be attempted. For example, if user estimates an average of \$23 annually in costs for repairing and checking one mile of fence, enter 23 in response to the question.

Next question asks if additional water resources on improved range will be developed. If the number 0 is typed, signifying a negative response, RIBPRO will begin printing Table 1. If 1 is typed signifying a positive response, the program will ask for the estimated total investment anticipated for additional water development on improved range. If, for example, a new well is to be sunk at a cost of \$8300, enter 8300 in response to this question.

Table 1. Perimeter Fencing and Cross Fencing for Selected Acreages of Square Configuration

Acres To Be Enclosed	Perimeter Fencing	Cross Fencing
(Acres)	(Miles)	(Miles)
40	1.00	.25
80	1.41	.35
120	1.73	.43
160	2.00	.50
200	2.24	.56
240	2.45	.61
280	2.65	.66
320	2.83	.71
360	3.00	.75
400	3.16	.79
440	3.32	.83
480	3.46	.87
520	3.61	.90
560	3.74	.94
600	3.87	.97
640	4.00	1.00
720	4.24	1.06
800	4.47	1.12
880	4.69	1.17
960	4.90	1.22
1040	5.10	1.27
1120	5.29	1.32
1200	5.48	1.37
1280	5.66	1.41
1360	5.83	1.46
1440	6.00	1.50
1520	6.16	1.54
1600	6.32	1.58
1680	6.48	1.62
1760	6.63	1.66
1840	6.78	1.70
1920	6.93	1.73

Final question in this section is, "Enter the estimated per AUM market value of your range (net of costs to you) in it's current unimproved state?" User should estimate dollar value of forage on land to be improved (on a per AUM basis) net of variable costs incurred in grazing this range. For example, if a user can rent unimproved range for \$5.50 per AUM and would incur costs (water maintenance, fence maintenance, etc.) of \$3.50, the net value received is \$2. Enter 2 in response to this question.

Internal Rate of Return Questions

RIBPRO asks five questions related to grass stand resulting from range improvement. These five questions are asked after the four cost tables are printed. Answers to these questions provide data to calculate an internal rate of return and expected total investment costs of a range improvement project. This section can be repeated as many times as desired using different input data. This allows an internal rate of return to be calculated for a variety of revenue and yield situations.

First question (for the seeding options only) asks user to estimate probability seeding will be successful in year one of range improvement. This value is entered as a number between 0 and 100. For example, if user estimates 75 percent probability of initial seeding success, enter 75 in response to this question.

RIBPRO now branches to the point where option 3, spray only, begins asking questions in this section. First question asks for user's predicted maximum forage yield per acre in the range improvement's peak production year (in pounds). For example, if user expects a maximum of 500 pounds of actual forage with 400 pounds of harvestable forage in year three, enter harvestable forage yield of 400 in response to this question.

RIBPRO now asks for user's predicted life of the range improvement. This can be any number of years up to a maximum of 40 years. Entering a value greater than 40 will result in an error message with instructions to try again. Crested wheatgrass seedlings have been known to survive over 30 years and still maintain grazing viability.

Next question asks how many years improved range will be held in nonuse following initial treatment. Nonuse may occur with seeding or plowing because seedlings require time to grow and establish themselves. At least two years of nonuse has been recommended by some physical scientists when seeding crested wheatgrass. If no period of nonuse is to be used (as in the case of spray only) type the number 0. If, for example, two years of nonuse are anticipated, type the number 2 in response to the question.

Next question asks user to predict a per AUM dollar value for forage resulting from range improvement activities. An approximate measure of this value may be current net rental charge of range in local area. For example, if a user has no idea of net range forage value, enter value corresponding to income from a cow for one month minus range seller management costs not accounted for in previous questions, e.g., checking cow numbers periodically. If this value is \$8.25, enter 8.25 in response to this question.

Final RIBPRO question asks for a predicted annual inflation rate over the time period of the project. This subjective estimate is used in calculating internal rate of return adjusted for inflation. It is assumed in the program that estimated costs and benefits from the project will increase over the project life at a rate equal to predicted inflation rate.

Table 5, "The Internal Rate of Return", is now calculated by RIBPRO based on, 1) user's investment cost per acre (from Table 4), 2) expected life of the improvement program, 3) maximum forage yield, 4) years of

nonuse indicated, 5) increase in land taxes, and 6) value assigned to an AUM of forage both before and after improvement. Internal rate of return may be calculated many times using different numbers for each "run" to give a range of returns. An internal rate of return table is printed twice for each program "run" (seeding option only). First printing of Table 5 gives internal rates of return (IRR) with initial seeding success, initial seeding failure and based on user's probability estimate of initial seeding failure. Initial investment is increased by cost of additional seeding for initial seeding failure. Revenues begin accruing a year later in this situation than with initial seeding success. RIBPRO prints expected total investment per acre, internal rate of return not adjusted for inflation, internal rate of return adjusted for inflation, average annual forage during usable years (pounds), and increased annual land tax due to increased forage. When user is satisfied with all completed program "runs", type the number 0 in response to the final inquiry, "Do you wish to try additional values to give you a range?" RIBPRO will then terminate and "runs" will be complete.

Table One

This table illustrates machinery fixed costs per hour of use. Five types of fixed costs are considered for machinery: 1) depreciation, 2) insurance, 3) taxes, and 4) repairs. See Appendix Table 2.

Depreciation

Depreciation is calculated utilizing the straight-line method as follows:

$$D = (C - S) / H$$

Where,

D = Depreciation per hour of life

C = Current value of machine

S = 10 percent salvage value (calculated as 10 percent of C)

H = Hours of life of machine

The one predetermined variable in this formula is 10 percent salvage value. Current value and hours of life are given by user. Hours of life is calculated utilizing percentage of life remaining which is input by user. This figure is multiplied by a standard hours of machine life for each machine. The standards used are as follows:

Wheel Tractors = 12000 hours

Crawler Tractors = 16000 hours

Modified Sprayer = 3500 hours

Rangeland Drill = 4000 hours

Rangeland Plow = 7500 hours

Insurance

Insurance is assumed to be carried on all implements. In practice, many users may only insure their most valuable pieces of equipment (tractors, combines, swathers, etc.) against fire, theft and weather. Insurance is calculated as follows:

$$E = (C / 2) \times .006 / U$$

Where,

E = Insurance cost per hour of use

C = Current value of machine

U = Annual hours of use

The value .006 is the insurance rate.

Taxes

Taxes are assumed to be levied on all ranch assets including machinery. Taxes may not be levied on machinery in some areas of the country but the program assumes tax liability. Taxes are calculated as follows:

$$T = (C \times .35 \times TR) / U$$

Where,

T = Tax cost per hour of use

C = Current value of machine

0.35 = Factor to convert current value to assessed value

TR = Tax rate. For example, \$3 per \$100 assessed valuation entered as 3.0.

U = Annual hours of use

Repairs

Annual equipment repair cost may be difficult to estimate before they occur. Repairs typically vary from year to year and machine to machine. Age of a machine as well as severity of use per unit of time are important determinants of annual repair costs.

Because of difficulties in estimating these costs, user is requested to give his estimate of the average annual repair cost for each machine considered. This figure is divided by annual hours of machine use to calculate repair cost per hour.

Other Features

Other features of Table 1 include printing machine name, current value of each machine, life in hours of each machine, and hours of annual ranch use. Depreciation, insurance, and taxes are added together to form the "total" column. Repairs are kept separate.

Table Two

This Table shows machinery fixed costs per treated acre. Fixed costs are costs which do not vary with number of units of output produced. Two main headings are: 1) Fixed costs per acre, and 2) Repair costs per acre. Fixed costs per acre include depreciation, insurance, and taxes. This table is fairly self explanatory and is illustrated in Appendix C.

Table Three

Table 3 shows initial variable input costs for the treatment project considered. Variable costs are costs which vary with number of units of output (head of cattle) produced. The program prints name of each input,

units of measurement for each input, comments about each input, cost per unit, cost per acre, and cost per total acres treated.

Examples of inputs printed in this table include, fuel, seed, herbicides, labor, and custom costs. These are costs which user enters and are operation specific.

Table Four

This Table illustrates the budget cost summary and an example is presented in Appendix Table 5. RIBPRO prints investment cost category, cost per acre, and cost per total acres treated. Cost categories include variable input costs, machinery fixed costs, machinery repair costs, machinery rental costs, and other costs. Other costs include archaeological survey costs, fencing costs, water development costs, and fence maintenance costs. Benefits from federal ACP payments are also included in this Table.

Table Five

Table five illustrates internal rates of return on a range improvement project given initial seeding success, initial seeding failure, and that expected mean value based on user probability of initial seeding failure. As noted previously, internal rate of return can be defined as the discount rate which equates present value of investment benefits with present value of investment costs. In addition, RIBPRO prints three values from data entered by user: 1) initial investment per acre, 2) average annual forage during usable years, and 3) increase in per acre land taxes. A fourth value, project life, is printed in the table title.

Average annual forage is an estimate of harvestable forage per acre in

pounds, rather than total forage produced. All forage produced will not likely be consumed by livestock because of trampling or other reasons. For example, of a total production of 1000 pounds per acre, livestock may consume an average of 600 to 800 pounds per acre.

If range is to be held open (nonused) for one or more years, this number of years indicated is eliminated as periods of income. They are treated as yielding zero gross revenue. Net revenue foregone from the range in its original condition is entered as a cost. If additional annual fence maintenance costs are incurred, these are subtracted from each year's revenues prior to calculating internal rate of return.

RIBPRO prints internal rate of return per acre based on user's estimate of project life and total investment per acre after any federal payments have been included (from Table 4). Table 5 can be recalculated and printed as many times as desired, allowing user to experiment with a variety of yields, market values and project lives. RIBPRO Table 5 is illustrated in Appendix Table B.

APPENDIX A

Summary of Information User Must Provide to Use RIBPRO

APPENDIX A

Summary of Information User Must Provide to Use RIBPRO

1. Number of acres to be improved
2. Forage production
 - (a) Current production in AUM's (animal unit months) of range acres to be improved
 - (b) Expected maximum harvestable forage yield in pounds per acre in peak production year.
 - (c) Per AUM value of range in current and improved condition (less variable costs of grazing)
 - (d) Estimated probability of successful first year seeding
 - (e) Predicted life of range improvement (maximum 40 years)
 - (f) Number of years improved range will not be grazed
3. Type of Range improvement program to be used (spray and seed, plow and seed, spray only)
4. Equipment and materials
 - (a) If equipment is owned, current market value, annual hours of use, annual maintenance and repair costs, and proportion of life remaining
 - (b) If equipment rented, rental cost
 - (c) Fuel use of tractors per hour and cost of fuel
 - (d) Acres per hour that can be sprayed, plowed and seeded
 - (e) Cost per unit of seed and herbicides and application rate per acre
5. Other costs
 - (a) Hourly cost of labor
 - (b) Per acre cost of archeological and cultural surveys
 - (c) Length and per mile cost of erecting and annual maintenance of additional fencing
 - (d) Total cost of additional water development and annual maintenance costs
 - (e) Property tax rate (dollars of taxes per \$100 of assessed valuation)
6. Dollar amount of anticipated federal ACP payments
7. Expected average rate of inflation during project life

APPENDIX B

RIBPRO Input Questions

*** RANGE IMPROVEMENT BUDGET PROGRAM ***

HOW MANY ACRES ARE TO BE IMPROVED ? 450
 HOW MANY ACRES OF YOUR UNIMPROVED RANGE ARE CURRENTLY USED
 TO SUPPORT ONE COW FOR ONE MONTH (HOW MANY ACRES PER AUM)? 18
 WHAT IS THE LOCAL PROPERTY TAX RATE AS IT APPLIES TO THE
 EQUIPMENT OWNED BY THE USER? ENTER THE TAX RATE AS
 A PERCENT. EXAMPLE: 3.5% ENTERED AS 3.5. ? 3.6
 WHAT TYPE OF IMPROVEMENT PROGRAM IS TO BE IMPLEMENTED
 (SPRAY AND SEED=1, PLOW AND SEED=2, SPRAY ONLY=3)? 1
 WILL GROUND OR AERIAL SPRAYING BE ACCOMPLISHED
 (1= GROUND, 2= AERIAL) ? 1
 ENTER THE CURRENT VALUE OF THE TRACTOR TO BE USED TO SPRAY? 15000
 ENTER THE CURRENT VALUE OF THE SPRAYER? 4500
 WHAT PROPORTION OF TRACTOR LIFE REMAINS (FOR EXAMPLE, IF 60
 PERCENT OF TRACTOR LIFE REMAINS, TYPE IN 60) ? 75
 ENTER THE ESTIMATED HOURS OF ANNUAL RANCH USE OF THE TRACTOR? 450
 WHAT PROPORTION OF SPRAYER LIFE REMAINS (FOR EXAMPLE, IF 30
 PERCENT REMAINS, TYPE IN 30) ? 85
 ENTER THE ESTIMATED HOURS OF ANNUAL RANCH USE OF THE SPRAYER? 275
 ENTER THE AVERAGE ANNUAL MAINTENANCE AND REPAIR COSTS
 FOR THE TRACTOR? 385
 ENTER THE AVERAGE ANNUAL MAINTENANCE AND REPAIR COSTS
 FOR THE SPRAYER? 210
 WILL THE SAME TRACTOR BE USED TO SEED THE RANGE (YES=1 ,NO=0) ? 0
 ENTER THE CURRENT VALUE OF THE TRACTOR TO BE USED TO SEED ? 18000
 WHAT PROPORTION OF TRACTOR LIFE REMAINS (FOR EXAMPLE, IF 60
 PERCENT REMAINS, TYPE IN 60) ? 90
 ENTER THE ESTIMATED HOURS OF ANNUAL RANCH USE OF THE TRACTOR? 385
 ENTER THE AVERAGE ANNUAL MAINTENANCE AND REPAIR COSTS
 FOR THE TRACTOR? 300
 DO YOU OWN THE RANGELAND DRILL (YES=1, NO=0)? 0
 ENTER THE RENTAL OR LEASE COST PER PERIOD OF USE
 FOR THE RANGELAND DRILL? 850
 HOW MANY ACRES PER HOUR CAN BE SPRAYED? 4.75
 WHAT IS THE SPRAYING TRACTOR'S FUEL USE PER HOUR? 3.2
 WHAT IS THE FUEL COST PER GALLON? 1.05
 HOW MANY HERBICIDES WILL BE APPLIED ? 1
 IS THE HERBICIDE PURCHASED BY THE POUND OR GALLON (TYPE EITHER
 POUND OR GALLON) ? GALLON
 ENTER COST PER GALLON FOR THE HERBICIDE ? 8.75
 ENTER THE GALLONS OF HERBICIDE APPLIED PER ACRE ? 7.45
 ENTER THE COST PER HOUR OF LABOR USED TO SPRAY? 4.25
 ENTER THE TOTAL LABOR HOURS REQUIRED TO SPRAY 450 ACRES ? 95
 HOW MANY ACRES PER HOUR CAN BE SEEDED ? 5
 WHAT IS THE SEEDING TRACTOR'S FUEL USE PER HOUR ? 3.6
 WHAT IS THE FUEL COST PER GALLON? 1.05
 HOW MANY POUNDS OF SEED WILL BE APPLIED PER ACRE? 6

WHAT IS THE COST PER POUND FOR SEED ? .75
 ENTER THE COST PER HOUR FOR LABOR USED TO SEED? 4.25
 ENTER THE TOTAL LABOR HOURS REQUIRED TO SEED 450 ACRES? 85
 DO YOU EXPECT TO RECEIVE FEDERAL ACP PAYMENTS TO HELP
 OFFSET YOUR INVESTMENT COSTS (1=YES, 0=NO) ? 1
 ENTER THE ESTIMATED PER ACRE COST OF ARCHAEOLOGICAL AND
 CULTURAL SURVEYS (THIS CURRENTLY RUNS 1-5 DOLLARS PER ACRE)? 3.35
 WILL ADDITIONAL FENCING SUCH AS CROSS FENCES BE BUILT
 TO ISOLATE YOUR IMPROVEMENT ACRES (1=YES, 0=NO)? 1
 HOW MANY MILES OF FENCING WILL BE BUILT (FOR EXAMPLE,
 ONE-TENTH OF A MILE IS ENTERED AS 0.10)? 2.25
 ENTER YOUR ESTIMATED COST PER MILE FOR BUILDING FENCE ? 1300
 ENTER YOUR ESTIMATED COST PER MILE FOR ANNUAL GENERAL
 FENCE MAINTENANCE? 45
 DO YOU PLAN TO DEVELOP ADDITIONAL WATER RESOURCES ON YOUR IMPROVED
 RANGE (SINK WELLS, ADD STORAGE TANKS, ETC.)(YES=1,0=NO)? 1
 ENTER YOUR ESTIMATED TOTAL INVESTMENT FOR ADDITIONAL WATER
 DEVELOPMENT ON IMPROVED RANGE? 3200
 ENTER YOUR ESTIMATED COST FOR ANNUAL WATER MAINTENANCE FOR
 WATER RESOURCES DEVELOPED ON IMPROVED RANGE? 160
 ENTER THE ESTIMATED PER AUM MARKET VALUE OF YOUR RANGE IN IT'S
 CURRENT UNIMPROVED STATE (LESS VARIABLE COSTS OF MANAGEMENT)
 I.E., RENTAL VALUE MINUS ALL VARIABLE MANAGEMENT COSTS ? 2.25

THIS SECTION OF THE PROGRAM COMPUTES INTERNAL RATE OF RETURN
 PER ACRE FOR YIELDS AND FORAGE VALUES OF YOUR CHOOSING. THIS
 PART OF THE PROGRAM MAY BE REPEATED AS MANY TIMES AS DESIRED
 ALLOWING YOU TO CONSIDER A RANGE OF FORAGE YIELDS AND VALUES.

*** *** *** *** *** *** ***

WHAT PROBABILITY WOULD YOU ASSIGN THE EVENT OF A FIRST YEAR
 SUCCESSFUL SEEDING (FOR EXAMPLE, IF THIS PROBABILITY IS 75 %
 YOU WOULD TYPE IN 75). ? 75

ENTER YOUR PREDICTED MAXIMUM HARVESTABLE FORAGE YIELD PER ACRE
 IN YOUR RANGE IMPROVEMENT'S PEAK PRODUCTION YEAR (IN POUNDS) ? 400

ENTER YOUR PREDICTED LIFE OF THE IMPROVEMENT PROGRAM
 (FOR EXAMPLE, 25 - UP TO A MAX OF 40 YEARS)? 30

HOW MANY YEARS WILL YOUR IMPROVED RANGE BE HELD IN NONUSE
 FOLLOWING TREATMENT (IF NONE THEN TYPE 0)? 2

ENTER YOUR PREDICTED PER AUM MARKET VALUE OF THE FORAGE REALIZED
 FROM RANGE IMPROVEMENTS (DOLLARS)? 4

ENTER YOUR PREDICTED ANNUAL INFLATION RATE OVER THE NEXT 30
 YEARS (FOR EXAMPLE, IF YOUR ESTIMATE IS 10 %, TYPE IN 10.0)? 8

WOULD YOU LIKE TO RECOMPUTE THE INTERNAL RATE OF RETURN TABLE
 WITH DIFFERENT VALUES (1=YES, 0=NO)? 0

APPENDIX C

RIBPRO Example Tables

TABLE 1. MACHINERY FIXED COSTS PER HOUR OF USE

		HOURS		COST PER HOUR (\$)				
EQUIPMNT	VALUE	LIFE	USE	DEPREC	INSUR	TAXES	TOTAL	REPAIR
TRACTOR1	15000	9000	450	1.50	.10	.42	2.02	2.00
SPRAYER	4500	2974	275	1.36	.05	.21	1.62	1.51
TRACTOR2	18000	10799	385	1.50	.14	.59	2.23	2.00

TABLE 2. MACHINERY FIXED COSTS PER TREATED ACRE

EQUIPMENT	FIXED COSTS/ACRE	REPAIR COSTS/ACRE
SPRAYING		
TRACTOR	.43	.42
SPRAYER	.34	.32
SUBTOTAL	.77	.74
SEEDING		
TRACTOR	.45	.40
SUBTOTAL	.45	.40
TOTAL	1.21	1.14

TABLE 3. INITIAL VARIABLE INPUT COSTS FOR TREATMENT PROJECT

INPUT	UNIT	COMMENT	COST PER UNIT	COST PER ACRE	COST FOR 450 AC.
SPRAYING					
FUEL	GALLON	3.20 GAL/HR	1.05	.71	318.32
HERBICIDE	GALLON	.45 GALLON /AC	8.75	3.94	1771.88
LABOR	HOURS	.21 HRS/AC	4.25	.90	403.75
SUBTOTAL				5.54	2493.94
SEEDING					
FUEL	GALLON	3.60 GAL/HR	1.05	.76	340.20
SEED	POUND	6.00 #/AC	.75	4.50	2025.00
LABOR	HOURS	.19 HRS/AC	4.25	.80	361.25
DRILL RENT	HOURS	.20 HRS/AC		1.89	850.00
SUBTOTAL				8.66	3894.77
TOTAL				14.20	6388.71

TABLE 4. BUDGET COST SUMMARY

INITIAL INVESTMENT COSTS	COST/ACRE	COST/ 450 ACRES
SPRAYING		
VARIABLE INPUT COSTS	5.54	2493.94
MACHINERY FIXED COSTS	.77	344.52
MACHINERY REPAIR COSTS	.74	332.77
SUBTOTAL	7.05	3171.24
SEEDING		
VARIABLE INPUT COSTS	8.66	3894.77
MACHINERY FIXED COSTS	.45	200.64
MACHINERY REPAIR COSTS	.40	180.00
SUBTOTAL	9.50	4275.41
OTHER COSTS		
ARCHAEOLOGICAL SURVEY	3.35	1507.50
FENCING COSTS	6.50	2925.00
WATER DEVELOP COSTS	7.11	3200.00
SUBTOTAL	16.96	7632.50
TOTAL INVESTMENT COSTS	33.51	15079.14
TOTAL LESS FEDERAL ACP PAYMENT	25.73	11579.14
ANNUAL COSTS		
FENCE MAINTENANCE COSTS	.23	101.25
WATER MAINTENANCE COSTS	.36	160.00
NONUSE COSTS	.12	56.25
TOTAL ANNUAL COSTS	.71	317.50

TABLE 5. INTERNAL RATE OF RETURN WITH AN ESTIMATED
PROJECT LIFE OF 30 YEARS.

	INITIAL SEEDING SUCCESS	INITIAL SEEDING FAILURE	EXPECTED BASED ON PROBABILITY
TOTAL INVESTMENT PER ACRE REQUIRED OVER LIFE OF THE PROJECT (DOLLARS)	25.73	35.23	28.11
INTERNAL RATE OF RETURN NOT ADJUSTED (%)	.36	-1.49	-.10
INTERNAL RATE OF RETURN ADJUSTED FOR INFLATION (%)	8.39	6.39	7.89
AVERAGE ANNUAL FORAGE DURING LIFE OF THE PROJECT (LBS)	358.93	358.89	358.92
INCREASED ANNUAL LAND TAX BASED ON INCREASED FORAGE (\$)	.19	.19	.19

APPENDIX D

RIBPRO Program

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00100 REM *****
00110 REM ***** RANGE IMPROVEMENT BUDGET PROGRAM *****
00120 REM ***** DEPARTMENT OF AGRICULTURAL AND RESOURCE ECONOMICS *****
00130 REM ***** UNIVERSITY OF NEVADA, RENO *****
00140 REM *****
00150 DIM A(25),H(35)
00160 DIM G(30),P(20)
00170 DIM V(20)
00180 DIM W(25)
00190 DIM E(20)
00200 DIM Z(20)
00210 REM ASSESSED PROPERTY VALUES ARE BASED ON PRODUCTIVITY OF LAND
00220 REM CLASS I LAND PRODUCES MORE THAN 1/4 AUMS PER ACRE
00230 REM CLASS II LAND PRODUCES BETWEEN 1/4 AND 1/6 AUMS PER ACRE
00240 REM CLASS III LAND PRODUCES BETWEEN 1/6 AND 1/12 AUMS PER ACRE
00250 REM CLASS IV LAND PRODUCES LESS THAN 1/12 AUMS PER ACRE
00260 REM WITH AN ASSESSED VALUE OF $6.60, $3.50, AND $2.10 AND $1.25 RESP
00270 X(1)=6.60
00280 X(2)=3.50
00290 X(3)=2.10
00300 X(4)=1.25
00310 GOSUB 09170
00320 PRINT TAB (15); "*** RANGE IMPROVEMENT BUDGET PROGRAM ***"
00330 PRINT
00340 PRINT "***** ***** ***** ***** ***** ***** ***** ***** ***** *****"
00350 PRINT
00360 PRINT
00370 REM---GO TO 9000---- FOR TEST (PROVIDES ALL INPUT FOR A RUN)
00380 PRINT "HOW MANY ACRES ARE TO BE IMPROVED";
00390 INPUT A1
00400 IF A1>0 THEN 00450
00410 IF A1=0 THEN 00430
00420 IF A1<0 THEN 00430
00430 PRINT " * ERROR, NUMBER OF ACRES MUST BE GREATER THAN ZERO"
00440 GO TO 00380
00450 PRINT "HOW MANY ACRES OF YOUR UNIMPROVED RANGE ARE CURRENTLY USED"
00460 PRINT " TO SUPPORT ONE COW FOR ONE MONTH (HOW MANY ACRES PER AUM)";
00470 INPUT G(28)
00480 G(29)= 1/G(28)
00580 PRINT "WHAT IS THE LOCAL PROPERTY TAX RATE AS IT APPLIES TO THE "
00590 PRINT " EQUIPMENT OWNED BY THE USER? ENTER THE TAX RATE AS"
00600 PRINT " A PERCENT. EXAMPLE: 3.5% ENTERED AS 3.5. ";
00610 INPUT T1
00620 T1=T1/100
00630 IF T1>100 THEN 00660
00640 IF T1<0 THEN 00660
00650 GO TO 00680
00660 PRINT "ERROR. THE TAX RATE MUST BE BETWEEN ZERO AND 100"
00670 GOTO 00580
00680 PRINT "WHAT TYPE OF IMPROVEMENT PROGRAM IS TO BE IMPLEMENTED"
00690 PRINT " (SPRAY AND SEED=1, PLOW AND SEED=2, SPRAY ONLY=3)";
00700 INPUT A3

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00710 IF A3<3 THEN 00730
00720 A3=4
00730 IF A3=2 THEN 01630
00740 IF A3=3 THEN 09010
00750 PRINT "WILL GROUND OR AERIAL SPRAYING BE ACCOMPLISHED"
00760 PRINT " ( 1= GROUND, 2= AERIAL )";
00770 INPUT H(30)
00780 IF H(30)=1 THEN 00840
00790 PRINT "ENTER THE ESTIMATED COST PER ACRE FOR AERIAL SPRAYING"
00800 PRINT " (EXCLUDE THE COST OF THE HERBICIDE)";
00810 INPUT H(31)
00820 H(32)= H(31)*A1
00830 IF H(30)=2 THEN 01160
00840 PRINT "ENTER THE CURRENT VALUE OF THE TRACTOR TO BE USED TO SPRAY";
00850 INPUT B1
00860 PRINT "ENTER THE CURRENT VALUE OF THE SPRAYER";
00870 INPUT B2
00880 PRINT "WHAT PROPORTION OF TRACTOR LIFE REMAINS (FOR EXAMPLE, IF 60"
00890 PRINT " PERCENT OF TRACTOR LIFE REMAINS, TYPE IN 60)";
00900 INPUT C1
00910 C1=C1/100
00920 IF C1>1 THEN 00950
00930 IF C1 < 0 THEN 00950
00940 GO TO 00970
00950 PRINT "* ERROR, DATA ENTERED MUST BE GREATER THAN ZERO AND LESS THAN 100"
00960 GO TO 00900
00970 PRINT "ENTER THE ESTIMATED HOURS OF ANNUAL RANCH USE OF THE TRACTOR";
00980 INPUT D1
00990 PRINT "WHAT PROPORTION OF SPRAYER LIFE REMAINS (FOR EXAMPLE, IF 30"
01000 PRINT " PERCENT REMAINS, TYPE IN 30)";
01010 INPUT C2
01020 C2=C2/100
01030 IF C2>1 THEN 01060
01040 IF C2 < 0 THEN 01060
01050 GO TO 01080
01060 PRINT "* ERROR, DATA ENTERED MUST BE GREATER THAN ZERO AND LESS THAN 100"
01070 GO TO 00990
01080 PRINT "ENTER THE ESTIMATED HOURS OF ANNUAL RANCH USE OF THE SPRAYER";
01090 INPUT D2
01100 PRINT "ENTER THE AVERAGE ANNUAL MAINTENANCE AND REPAIR COSTS"
01110 PRINT " FOR THE TRACTOR";
01120 INPUT E1
01130 PRINT "ENTER THE AVERAGE ANNUAL MAINTENANCE AND REPAIR COSTS"
01140 PRINT " FOR THE SPRAYER";
01150 INPUT E2
01160 IF A3=4 THEN 02180
01170 IF H(30)=2 THEN 01200
01180 PRINT "WILL THE SAME TRACTOR BE USED TO SEED THE RANGE (YES=1 ,NO=0)";
01190 INPUT X1
01200 IF X1=1 THEN 01380
01210 IF X1=0 THEN 01220
01220 PRINT "ENTER THE CURRENT VALUE OF THE TRACTOR TO BE USED TO SEED";

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01230 INPUT B4
01240 PRINT "WHAT PROPORTION OF TRACTOR LIFE REMAINS (FOR EXAMPLE, IF 60"
01250 PRINT "   PERCENT REMAINS, TYPE IN 60)";
01260 INPUT C4
01270 C4=C4/100
01280 IF C4>1 THEN 01310
01290 IF C4 < 0 THEN 01310
01300 GO TO 01330
01310 PRINT "+ ERROR, DATA ENTERED MUST BE GREATER THAN ZERO AND LESS THAN ONE"
01320 GO TO 01240
01330 PRINT "ENTER THE ESTIMATED HOURS OF ANNUAL RANCH USE OF THE TRACTOR";
01340 INPUT D4
01350 PRINT "ENTER THE AVERAGE ANNUAL MAINTENANCE AND REPAIR COSTS"
01360 PRINT "   FOR THE TRACTOR";
01370 INPUT E4
01380 PRINT "DO YOU OWN THE RANGELAND DRILL (YES=1, NO=0)";
01390 INPUT M(10)
01400 IF M(10)=0 THEN 01570
01410 PRINT "ENTER THE CURRENT VALUE OF THE RANGELAND DRILL";
01420 INPUT B5
01430 PRINT "WHAT PROPORTION OF DRILL LIFE REMAINS (FOR EXAMPLE, IF 45"
01440 PRINT "   PERCENT OF DRILL LIFE REMAINS, TYPE IN 45)";
01450 INPUT C5
01460 C5=C5/100
01470 IF C5 > 1 THEN 01500
01480 IF C5 < 0 THEN 01500
01490 GO TO 01520
01500 PRINT "+ ERROR, DATA ENTERED MUST BE GREATER THAN ZERO AND LESS THAN 100"
01510 GO TO 01430
01520 PRINT "ENTER THE ESTIMATED HOURS OF ANNUAL RANCH USE OF THE DRILL";
01530 INPUT D5
01540 PRINT "ENTER THE AVERAGE ANNUAL MAINTENANCE AND REPAIR COSTS"
01550 PRINT "   FOR THE DRILL";
01560 INPUT E5
01570 IF M(10)= 1 THEN 01620
01580 PRINT "ENTER THE RENTAL OR LEASE COST PER PERIOD OF USE"
01590 PRINT "   FOR THE RANGELAND DRILL";
01600 INPUT M(11)
01610 W(21)= M(11)/A1
01620 GO TO 02180
01630 PRINT "DO YOU OWN THE TRACTOR TO BE USED FOR RANGE"
01640 PRINT "   PLOWING (YES=1, NO=0)";
01650 INPUT X2
01660 X2=X2/100
01670 IF X2=1 THEN 01690
01680 IF X2=0 THEN 01980
01690 PRINT "ENTER THE CURRENT VALUE OF THE TRACTOR TO BE USED"
01700 PRINT "   TO PLOW RANGE";
01710 INPUT B6
01720 PRINT "WHAT PROPORTION OF TRACTOR LIFE REMAINS (FOR EXAMPLE, IF 45"
01730 PRINT "   PERCENT REMAINS, TYPE IN 45)";
01740 INPUT C6

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01750 C6=C6/100
01760 IF C6>1 THEN 01790
01770 IF C6 < 0 THEN 01790
01780 GO TO 01810
01790 PRINT "* ERROR, DATA ENTERED MUST BE GREATER THAN ZERO AND LESS THAN 100"
01800 GO TO 01720
01810 PRINT "ENTER THE ESTIMATED HOURS OF TOTAL ANNUAL RANCH USE"
01820 PRINT "    OF THIS TRACTOR";
01830 INPUT D6
01840 PRINT "ENTER THE AVERAGE ANNUAL MAINTENANCE AND REPAIR COSTS"
01850 PRINT "    FOR THIS TRACTOR";
01860 INPUT E6
01870 GO TO 01920
01880 REM IF THE TRACTOR IS NOT OWNED THEN THE FOLLOWING APPLY
01890 PRINT "ENTER THE TOTAL RENTAL OR LEASE COST PER PERIOD OF USE"
01900 PRINT "    FOR THIS TRACTOR";
01910 INPUT Y1
01920 PRINT "DO YOU OWN THE RANGELAND PLOW (YES=1, NO=0)";
01930 INPUT X3
01940 IF X3=1 THEN 01950
01950 IF X3=0 THEN 02140
01960 PRINT "ENTER THE CURRENT VALUE OF THE RANGELAND PLOW";
01970 INPUT B7
01980 PRINT "WHAT PROPORTION OF PLOW LIFE REMAINS (FOR EXAMPLE, IF 65"
01990 PRINT "    PERCENT REMAINS, TYPE IN 65)";
02000 INPUT C7
02010 C7=C7/100
02020 IF C7>1 THEN 02050
02030 IF C7 < 0 THEN 02050
02040 GO TO 02070
02050 PRINT "* ERROR, DATA ENTERED MUST BE GREATER THAN ZERO AND LESS THAN 100"
02060 GO TO 01980
02070 PRINT "ENTER THE ESTIMATED HOURS OF TOTAL ANNUAL RANCH USE OF THE PLOW";
02080 INPUT D7
02090 PRINT "ENTER THE AVERAGE ANNUAL MAINTENANCE AND REPAIR COSTS FOR"
02100 PRINT "    THE RANGELAND PLOW";
02110 INPUT E7
02120 GO TO 01220
02130 REM IF THE RANGELAND PLOW IS NOT OWNED THEN THE FOLLOWING APPLIES
02140 PRINT "ENTER THE TOTAL RENTAL OR LEASE COST PER PERIOD OF USE"
02150 PRINT "    FOR THE RANGELAND PLOW";
02160 INPUT Y2
02170 GO TO 01220
02180 REM VARIABLE INPUT COST QUESTIONS
02190 IF A3=2 THEN 02660
02200 IF A3=3 THEN 09010
02210 IF M(30)=2 THEN 02280
02220 PRINT "HOW MANY ACRES PER HOUR CAN BE SPRAYED";
02230 INPUT F1
02240 PRINT "WHAT IS THE SPRAYING TRACTOR'S FUEL USE PER HOUR";
02250 INPUT F2
02260 PRINT "WHAT IS THE FUEL COST PER GALLON";

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02270 INPUT F3
02280 PRINT "HOW MANY HERBICIDES WILL BE APPLIED";
02290 INPUT X4
02300 IF X4=1 THEN 02520
02310 IF X4=2 THEN 02370
02320 IF X4>2 THEN 02330
02330 PRINT "** YOU APPLIED TOO MANY HERBICIDES TO BE CONSIDERED IN THIS"
02340 PRINT "** PROGRAM. INDICATE TWO OR LESS FOR EACH PROGRAM RUN"
02350 PRINT
02360 GO TO 02280
02370 PRINT "IS HERBICIDE 1 PURCHASED BY POUND OR GALLON (TYPE EITHER";
02380 PRINT "    POUND OR GALLON)";
02390 INPUT Y$
02400 PRINT "IS HERBICIDE 2 PURCHASED BY POUND OR GALLON (TYPE EITHER";
02410 PRINT "    POUND OR GALLON)";
02420 INPUT X$
02430 PRINT "ENTER COST PER " (Y$) " FOR HERBICIDE ONE";
02440 INPUT F4
02450 PRINT "ENTER COST PER " (X$) " FOR HERBICIDE TWO";
02460 INPUT F6
02470 PRINT "ENTER " (Y$)"S OF HERBICIDE ONE APPLIED PER ACRE";
02480 INPUT F5
02490 PRINT "ENTER " (X$)"S OF HERBICIDE TWO APPLIED PER ACRE";
02500 INPUT F7
02510 GO TO 02590
02520 PRINT "IS THE HERBICIDE PURCHASED BY THE POUND OR GALLON (TYPE EITHER";
02530 PRINT "    POUND OR GALLON)";
02540 INPUT Y$
02550 PRINT "ENTER COST PER "(Y$)" FOR THE HERBICIDE";
02560 INPUT F4
02570 PRINT "ENTER THE " (Y$)"S OF HERBICIDE APPLIED PER ACRE";
02580 INPUT F5
02590 IF M(30)=2 THEN 02640
02600 PRINT "ENTER THE COST PER HOUR OF LABOR USED TO SPRAY";
02610 INPUT F8
02620 PRINT "ENTER THE TOTAL LABOR HOURS REQUIRED TO SPRAY"(A1)"ACRES";
02630 INPUT F9
02640 IF A3=4 THEN 02910
02650 GO TO 02770
02660 PRINT "HOW MANY ACRES CAN BE PLOWED IN ONE HOUR";
02670 INPUT G1
02680 PRINT "WHAT IS THE PLOWING TRACTOR'S FUEL USE PER HOUR";
02690 INPUT G2
02700 PRINT "WHAT IS THE FUEL COST PER GALLON";
02710 INPUT G3
02720 PRINT "ENTER THE COST PER HOUR OF LABOR USED TO PLOW";
02730 INPUT G4
02740 PRINT "ENTER THE TOTAL LABOR HOURS USED TO PLOW"(A1)"ACRES";
02750 INPUT G5
02760 REM SEEDING VARIABLE COSTS
02770 PRINT "HOW MANY ACRES PER HOUR CAN BE SEEDED";
02780 INPUT H1

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02790 PRINT "WHAT IS THE SEEDING TRACTOR'S FUEL USE PER HOUR";
02800 INPUT H2
02810 PRINT "WHAT IS THE FUEL COST PER GALLON";
02820 INPUT H3
02830 PRINT "HOW MANY POUNDS OF SEED WILL BE APPLIED PER ACRE";
02840 INPUT H4
02850 PRINT "WHAT IS THE COST PER POUND FOR SEED";
02860 INPUT H5
02870 PRINT "ENTER THE COST PER HOUR FOR LABOR USED TO SEED";
02880 INPUT H6
02890 PRINT "ENTER THE TOTAL LABOR HOURS REQUIRED TO SEED"(A1)"ACRES";
02900 INPUT H7
02910 PRINT "DO YOU EXPECT TO RECEIVE FEDERAL ACP PAYMENTS TO HELP";
02920 PRINT "    OFFSET YOUR INVESTMENT COSTS (1=YES, 0=NO)";
02930 INPUT G7
02940 IF G7=0 THEN 02980
02950 PRINT "ENTER THE ESTIMATED PER ACRE COST OF ARCHAEOLOGICAL AND";
02960 PRINT "    CULTURAL SURVEYS (THIS CURRENTLY RUNS 1-5 DOLLARS PER ACRE)";
02970 INPUT G8
02980 PRINT "WILL ADDITIONAL FENCING SUCH AS CROSS FENCES BE BUILT";
02990 PRINT "    TO ISOLATE YOUR IMPROVEMENT ACRES (1=YES, 0=NO)";
03000 INPUT G9
03010 IF G9=0 THEN 03100
03020 PRINT "HOW MANY MILES OF FENCING WILL BE BUILT (FOR EXAMPLE,";
03030 PRINT "    ONE-TENTH OF A MILE IS ENTERED AS 0.10)";
03040 INPUT G(10)
03050 PRINT "ENTER YOUR ESTIMATED COST PER MILE FOR BUILDING FENCE";
03060 INPUT G(11)
03070 PRINT "ENTER YOUR ESTIMATED COST PER MILE FOR ANNUAL GENERAL";
03080 PRINT "    FENCE MAINTENANCE";
03090 INPUT G(12)
03100 PRINT "DO YOU PLAN TO DEVELOP ADDITIONAL WATER RESOURCES ON YOUR IMPROVED"
03110 PRINT "    RANGE (SINK WELLS, ADD STORAGE TANKS, ETC.)(YES=1,0=NO)";
03120 INPUT H(12)
03130 IF H(12) = 0 THEN 03220
03140 PRINT "ENTER YOUR ESTIMATED TOTAL INVESTMENT FOR ADDITIONAL WATER"
03150 PRINT "    DEVELOPMENT ON IMPROVED RANGE";
03160 INPUT H(13)
03170 H(14)= H(13) / A1
03180 PRINT "ENTER YOUR ESTIMATED COST FOR ANNUAL WATER MAINTENANCE FOR"
03190 PRINT "    WATER RESOURCES DEVELOPED ON IMPROVED RANGE";
03200 INPUT G(24)
03210 G(25)= G(24) / A1
03220 PRINT "ENTER THE ESTIMATED PER AUM MARKET VALUE OF YOUR RANGE IN IT'S"
03230 PRINT "    CURRENT UNIMPROVED STATE (LESS VARIABLE COSTS OF MANAGEMENT)"
03240 PRINT "    I.E., RENTAL VALUE MINUS ALL VARIABLE MANAGEMENT COSTS";
03250 INPUT G(30)
03260 G(26) = G(30)*G(29)
03270 G(27) = G(26)*A1
03280 REM    DETERMINE LAND TAX ON UNIMPROVED LAND
03290 REM
03300 X=G(29)

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03310 GOSUB 09550
03320 X(5)=X
03330 REM COMPUTE YEARS OF MACHINE LIFE
03340 C1=(C1*12000)
03350 C2=(C2*3500)
03360 C4=(C4*12000)
03370 C5=(C5*4000)
03380 C6=(C6*16000)
03390 C7=(C7*7500)
03400 REM CALCULATE MACHINERY FIXED COSTS
03410 IF A3=2 THEN 03580
03420 IF A3=3 THEN 09010
03430 IF M(30)=2 THEN 03560
03440 J1=(B1-0.1*B1)/C1
03450 J2=(B2-0.1*B2)/C2
03480 L1=(B1/2)*0.006/D1
03490 L2=(B2/2)*0.006/D2
03500 M1=(B1*0.35)*T1/D1
03510 M2=(B2*0.35)*T1/D2
03520 N1=B1*1.2/C1
03530 N2=B2*1/C2
03540 O1=J1+L1+M1
03550 O2=J2+L2+M2
03560 IF A3=4 THEN 03870
03570 IF A3=1 THEN 03730
03580 IF X2=0 THEN 03650
03590 J3=(B6-0.1*B6)/C6
03610 L3=(B6/2)*0.006/D6
03620 M3=(B6*0.35)*T1/D6
03630 N3=B6*1.2/C6
03640 O3=J3+L3+M3
03650 IF X3=0 THEN 03740
03660 J4=(B7-0.1*B7)/C7
03680 L4=(B7/2)*0.006/D7
03690 M4=(B7*0.35)*T1/D7
03700 N4=B7*1/C7
03710 O4=J4+L4+M4
03720 REM SEEDING FIXED COSTS
03730 IF X1=1 THEN 03800
03740 J5=(B4-0.1*B4)/C4
03760 L5=(B4/2)*0.006/D4
03770 M5=(B4*0.35)*T1/D4
03780 N5=B4*1.2/C4
03790 O5=J5+L5+M5
03800 IF M(10)=0 THEN 03900
03810 J6=(B5-0.1*B5)/C5
03830 L6=(B5/2)*0.006/D5
03840 M6=(B5*0.35)*T1/D5
03850 N6=B5*0.5/C5
03860 O6=J6+L6+M6
03870 IF M(30)=2 THEN 03890
03880 GO TO 03900

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03890 IF A3=4 THEN 05090
03900 REM PRINT THE FIXED COST PER HOUR TABLE
03910 GOSUB 09170
03920 PRINT "TABLE 1. MACHINERY FIXED COSTS PER HOUR OF USE"
03930 GOSUB 09020
03940 PRINT USING 04220, "HOURS", "COST", "PER", "HOUR", "($)"
03950 PRINT TAB(17); "-----"
03960 PRINT USING 04230, "EQUIPMNT", "VALUE", "LIFE", "USE", "DEPREC";
03970 PRINT "INSUR TAXES TOTAL REPAIR"
03980 GOSUB 09060
03990 IF A3=2 THEN 04140
04000 IF A3=3 THEN 09010
04010 IF M(30)=2 THEN 04080
04020 PRINT USING 04240, "TRACTOR1", B1, C1, D1, J1, L1, M1, O1, N1
04030 PRINT
04040 PRINT USING 04240, "SPRAYER", B2, C2, D2, J2, L2, M2, O2, N2
04050 PRINT
04060 IF A3=4 THEN 04210
04070 IF X1=1 THEN 04110
04080 PRINT USING 04240, "TRACTOR2", B4, C4, D4, J5, L5, M5, O5, N5
04090 PRINT
04100 IF M(10)=0 THEN 04130
04110 PRINT USING 04240, "DRILL", B5, C5, D5, J6, L6, M6, O6, N6
04120 PRINT
04130 GO TO 04210
04140 IF X2=0 THEN 04170
04150 PRINT USING 04240, "TRACTOR1", B6, C6, D6, J3, L3, M3, O3, N3
04160 PRINT
04170 IF X3=0 THEN 04080
04180 PRINT USING 04240, "PLOW", B7, C7, D7, J4, L4, M4, O4, N4
04190 PRINT
04200 GO TO 04080
04210 GOSUB 09100
04220:          #####          ### ## ## ## ##
04230:#####          #####          #####          #####
04240:#####          #####          ## ## ## ## ## ## ## ## ## ## ## ## ## ## ## ##
04250 REM COMPUTE PER ACRE FIXED AND REPAIR COSTS PER ACRE
04260 IF A3=2 THEN 04340
04270 IF M(30)=2 THEN 04340
04280 P1=1/F1
04290 Q1=O1*P1
04300 Q2=N1*P1
04310 Q3=O2*P1
04320 Q4=N2*P1
04330 IF A3=4 THEN 04490
04340 REM SEEDING MACHINERY COST PER ACRE
04350 P2=1/H1
04360 Q5=O5*P2
04370 Q6=N5*P2
04380 Q7=O6*P2
04390 Q8=N6*P2
04400 IF A3=1 THEN 04490

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04410 REM PLOWING MACHINERY COST PER ACRE
04420 P3=1/G1
04430 IF X2=0 THEN 04460
04440 Q9=Q3*P3
04450 S1=N3*P3
04460 IF X3=0 THEN 04490
04470 S2=Q4*P3
04480 S3=N4*P3
04490 REM PRINT THE FIXED COST PER ACRE TABLE
04500 PRINT "TABLE 2. MACHINERY FIXED COSTS PER TREATED ACRE"
04510 GOSUB 09020
04520 PRINT USING 05050,"EQUIPMENT","FIXED","COSTS/ACRE","REPAIR","COSTS/ACRE"
04530 GOSUB 09060
04540 IF M(30)=2 THEN 04650
04550 IF A3=2 THEN 04880
04560 PRINT "SPRAYING"
04570 PRINT
04580 PRINT USING 05060,"TRACTOR",Q1,Q2
04590 PRINT USING 05060,"SPRAYER",Q3,Q4
04600 PRINT
04610 U1=Q1+Q3
04620 U2=Q2+Q4
04630 PRINT USING 05070,"SUBTOTAL",U1,U2
04640 PRINT
04650 IF A3=4 THEN 04990
04660 PRINT
04670 PRINT "SEEDING"
04680 PRINT
04690 IF XI=1 THEN 04790
04700 PRINT USING 05060,"TRACTOR",Q5,Q6
04710 IF M(10)=0 THEN 04730
04720 PRINT USING 05060,"DRILL",Q7,Q8
04730 PRINT
04740 U3=Q5+Q7
04750 U4=Q6+Q8
04760 PRINT USING 05070,"SUBTOTAL",U3,U4
04770 PRINT
04780 GO TO 04990
04790 PRINT USING 05060,"TRACTOR",Q1,Q2
04800 IF M(10)=0 THEN 04830
04810 PRINT USING 05060,"DRILL",Q7,Q8
04820 PRINT
04830 A(15)=Q1+Q7
04840 A(16)=Q2+Q8
04850 PRINT USING 05070,"SUBTOTAL",A(15),A(16)
04860 PRINT
04870 GO TO 04990
04880 PRINT "PLOWING"
04890 PRINT
04900 IF X2=0 THEN 04920
04910 PRINT USING 05060,"TRACTOR",Q9,S1
04920 IF X3=0 THEN 04940

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04930 PRINT USING 05060,"PLOW",S2,S3
04940 PRINT
04950 U5=Q9+S2
04960 U6=S1+S3
04970 PRINT USING 05070,"SUBTOTAL",U5,U6
04980 GO TO 04660
04990 PRINT
05000 U7=U1+U3+U5+A(15)
05010 U8=U2+U4+U6+A(16)
05020 PRINT USING 05080,"TOTAL",U7,U8
05030 PRINT
05040 GO SUB 09100
05050:      #####          ##### #####          ##### #####
05060:      #####          ###.##          ###.##
05070:      #####          ###.##          ###.##
05080:#####          ###.##          ###.##
05090 REM  COMPUTE VARIABLE INPUT COST TABLE
05100 IF A3=2 THEN 05250
05110 W1=(P1*F2)*F3
05120 U2=W1*A1
05130 W3=F4*F5
05140 W4=W3*A1
05150 IF X4=1 THEN 05180
05160 W5=F6*F7
05170 W6=W5*A1
05180 W7=F9/A1
05190 W8=W7*F8
05200 W9=W8*A1
05210 DIM W(30)
05220 W(10)=W1+W3+W5+W8+M(31)
05230 W(11)=W2+W4+W6+W9+M(32)
05240 GO TO 05370
05250 REM  FLOWING INPUT COSTS
05260 W(12)=(P3*G2)*G3
05270 W(13)=W(12)*A1
05280 W(14)=G5/A1
05290 W(15)=W(14)*G4
05300 W(16)=W(15)*A1
05310 IF X2=1 THEN 05330
05320 W(17)=Y1/A1
05330 IF X3=1 THEN 05350
05340 W(18)=Y2/A1
05350 W(19)=W(12)+W(15)+W(17)+W(18)
05360 W(20)=W(13)+W(16)+Y1+Y2
05370 REM  SEEDING INPUT COSTS
05380 REM  IF THE SPRAY TRACTOR WAS USED TO SEED THEN THE NEXT TWO APPLY
05390 IF X1 =0 THEN 05420
05400 X8=(P2*F2)*F3
05410 X9=V1*A1
05420 V1= W1
05430 V2= W2
05440 V3=(P2*H2)*H3

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05450 V4=V3*A1
05460 V5=H4*H5
05470 V6=V5*A1
05480 V7=H7/A1
05490 V8=V7*H6
05500 V9=V8*A1
05510 V(10)=V1+V3+V5+V8+W(21)
05520 V(11)=V2+V4+V6+V9+H(11)
05530 V(12)=W(10)+W(19)+V(10)
05540 V(13)=W(11)+W(20)+V(11)
05550 REM PRINT TABLE THREE
05560 PRINT "TABLE 3. INITIAL VARIABLE INPUT COSTS FOR TREATMENT PROJECT"
05570 GOSUB 09020
05580 PRINT USING 06120,"INPUT","UNIT","COMMENT","COST","COST","COST FOR"
05590 PRINT USING 06130,"PER UNIT","PER ACRE",A1,"AC."
05600 GOSUB 09060
05610 IF A3=2 THEN 05990
05620 PRINT "SPRAYING"
05630 PRINT
05640 IF H(30)=2 THEN 05660
05650 PRINT USING 06140,"FUEL","GALLON",(F2),"GAL/HR",(F3),(V1),(V2)
05660 PRINT USING 06170,"HERBICIDE1",(Y$),(F5),(Y$),"/AC",(F4),(W3),(W4)
05670 IF H(30)=1 THEN 05690
05680 PRINT USING 06160,"AIRPLANE","COST",H(31),H(32)
05690 IF X4=1 THEN 05710
05700 PRINT USING 06170,"HERBICIDE2",(X$),(F7),(X$),"/AC",(F6),(W5),(W6)
05710 IF H(30)=2 THEN 05730
05720 PRINT USING 06140,"LABOR","HOURS",(W7),"HRS/AC",(F8),(W8),(W9)
05730 PRINT
05740 PRINT USING 06180,"SUBTOTAL",(W(10)),(W(11))
05750 PRINT
05760 IF A3=4 THEN 06110
05770 PRINT "SEEDING"
05780 PRINT
05790 IF X1=1 THEN 05850
05800 IF A3=2 THEN 05850
05810 V(14)=F2
05820 V(15)=F3
05830 V(16)=V1
05840 V(17)=V2
05850 V(14)=H2
05860 V(15)=H3
05870 V(16)=V3+X8
05880 V(17)=V4+X9
05890 PRINT USING 06140,"FUEL","GALLON",V(14),"GAL/HR",V(15),V(16),V(17)
05900 PRINT USING 06140,"SEED","POUND",(H4),"#/AC",(H5),(V5),(V6)
05910 PRINT USING 06140,"LABOR","HOURS",(V7),"HRS/AC",(H6),(V8),(V9)
05920 IF H(10)= 1 THEN 05940
05930 PRINT USING 06150,"DRILL RENT","HOURS",(P2),"HRS/AC",W(21),H(11)
05940 PRINT
05950 PRINT USING 06180,"SUBTOTAL",(V(10)),(V(11))
05960 PRINT

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05970 PRINT USING 06190,"TOTAL",V(12),V(13)
05980 GO TO 06200
05990 PRINT "PLOWING"
06000 PRINT
06010 PRINT USING 06140,"FUEL","GALLON",(G2),"GAL/HR",(G3),(W(12)),(W(13))
06020 PRINT USING 06140,"LABOR","HOURS",(W(14)),("HRS/AC",(G4),(W(15)),(W(16))
06030 IF X2=1 THEN 06050
06040 PRINT USING 06150,"TRACT RENT","HOURS",(P3),"HRS/AC",(W(17)),Y1
06050 IF X3=1 THEN 06070
06060 PRINT USING 06150,"PLOW RENT","HOURS",(P3),"HRS/AC",(W(18)),Y2
06070 PRINT
06080 PRINT USING 06180,"SUBTOTAL",(W(19)),(W(20))
06090 PRINT
06100 GO TO 05770
06110 PRINT
06120:  #####          #####          #####          #####          #####          #####
06130:          #####          #####          #####          #####          #####          #####
06140:  #####          #####          ##.##          #####          ##.##          ##.##          #####.##
06150:  #####          #####          ##.##          #####          ##.##          ##.##          #####.##
06160:  #####          #####          #####          #####          #####          #####          #####.##
06170:  #####          #####          ##.##          #####          ##.##          ##.##          #####.##
06180:  #####          #####          #####          #####          #####          #####          #####.##
06190: #####          #####          #####          #####          #####          #####          #####.##
06200 GOSUB 09100
06210 REM  PRINT THE BUDGET COST SUMMARY TABLE
06220 PRINT
06230 PRINT
06240 PRINT "TABLE 4. BUDGET COST SUMMARY"
06250 GOSUB 09020
06260 PRINT USING 07210,"INITIAL","INVESTMENT","COSTS","COST/ACRE";
06270 PRINT "COST/"(A1)"ACRES"
06280 GOSUB 09060
06290 IF A3=2 THEN 06450
06300 PRINT "SPRAYING"
06310 PRINT
06320 Z1=U1+A1
06330 Z2=U2+A1
06340 PRINT USING 07220,"VARIABLE INPUT COSTS",(W(10)),(W(11))
06350 IF M(30)=2 THEN 06380
06360 PRINT USING 07220,"MACHINERY FIXED COSTS",(U1),(Z1)
06370 PRINT USING 07220,"MACHINERY REPAIR COSTS",(U2),(Z2)
06380 Z3=W(10)+U1+U2
06390 Z4=W(11)+Z1+Z2
06400 PRINT
06410 PRINT USING 07230,"SUBTOTAL",(Z3),(Z4)
06420 PRINT
06430 IF A3=4 THEN 06720
06440 GO TO 06580
06450 PRINT "PLOWING"
06460 PRINT
06470 PRINT USING 07220,"VARIABLE INPUT COSTS",(W(19)),(W(20))
06480 Z5=U5*A1

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06490 Z6=U6*A1
06500 PRINT USING 07220,"MACHINERY FIXED COSTS",(U5),(Z5)
06510 PRINT USING 07220,"MACHINERY REPAIR COSTS",(U6),(Z6)
06520 Z7=U(19)+U5+U6
06530 Z8=U(20)+Z5+Z6
06540 PRINT
06550 PRINT USING 07230,"SUBTOTAL",Z7,Z8
06560 PRINT
06570 REM SEEDING
06580 PRINT "SEEDING"
06590 PRINT
06600 Z9=(U3+A(15))*A1
06610 Z(10)=(U4+A(16))*A1
06620 Z(11)=U3+A(15)
06630 Z(12)=U4+A(16)
06640 PRINT USING 07220,"VARIABLE INPUT COSTS",V(10),V(11)
06650 PRINT USING 07220,"MACHINERY FIXED COSTS",Z(11),Z9
06660 PRINT USING 07220,"MACHINERY REPAIR COSTS",Z(12),Z(10)
06670 PRINT
06680 Z(13)=V(10)+Z(11)+Z(12)
06690 Z(14)=V(11)+Z9+Z(10)
06700 PRINT USING 07230,"SUBTOTAL",Z(13),Z(14)
06710 PRINT
06720 PRINT "OTHER COSTS"
06730 PRINT
06740 IF G7=0 THEN 06770
06750 Z(15)=G8*A1
06760 PRINT USING 07220,"ARCHAEOLOGICAL SURVEY",G8,Z(15)
06770 IF G9=0 THEN 06780
06780 IF G7=0 THEN 06820
06790 Z(16)=G(10)*G(11)
06800 Z(17)=Z(16)/A1
06810 PRINT USING 07220,"FENCING COSTS",Z(17),Z(16)
06820 IF H(12)=0 THEN 06850
06830 PRINT USING 07220,"WATER DEVELOP COSTS",H(14),H(13)
06840 PRINT
06850 Z(18)=G8+Z(17)+H(14)
06860 Z(19)=Z(15)+Z(16)+H(13)
06870 PRINT USING 07230,"SUBTOTAL",Z(18),Z(19)
06880 PRINT
06890 PRINT
06900 G(15)=Z3+Z7+Z(13)+Z(18)
06910 G(16)=Z4+Z8+Z(14)+Z(19)
06920 PRINT USING 07240,"TOTAL INVESTMENT COSTS",G(15),G(16)
06930 IF G7=0 THEN 07030
06940 IF G(16) > 7000 THEN 06980
06950 G(15)=G(15)*0.50
06960 G(16)=G(16)*0.50
06970 GO TO 07020
06980 A(21)= 3500/A1
06990 G(15)= G(15)-A(21)
07000 G(16)= G(16)-3500

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07010 PRINT
07020 PRINT USING 07240,"TOTAL LESS FEDERAL ACP PAYMENT",G(15),G(16)
07030 PRINT
07040 PRINT
07050 PRINT "ANNUAL COSTS"
07060 PRINT
07070 G(17)=(G(12)+G(10))/A1
07080 G(18)=G(12)+G(10)
07090 IF G9=0 THEN 07110
07100 PRINT USING 07220,"FENCE MAINTENANCE COSTS",G(17),G(18)
07110 IF M(12)=0 THEN 07140
07120 PRINT
07130 PRINT USING 07220,"WATER MAINTENANCE COSTS", G(25),G(24)
07140 PRINT
07150 PRINT USING 07220,"NONUSE COSTS", G(26),G(27)
07160 P(12)= G(17)+G(26)+G(25)
07170 P(13)= G(18)+G(24)+G(27)
07180 PRINT
07190 PRINT USING 07240,"TOTAL ANNUAL COSTS",P(12),P(13)
07200 PRINT
07210:#####
07220:#####
07230:#####
07240:#####
07250 GOSUB 09100
07260 PRINT "***          ***          ***          ***          ***          ***          ***          ***"
07270 PRINT
07280 PRINT "THIS SECTION OF THE PROGRAM COMPUTES INTERNAL RATE OF RETURN"
07290 PRINT "PER ACRE FOR YIELDS AND FORAGE VALUES OF YOUR CHOOSING. THIS"
07300 PRINT "PART OF THE PROGRAM MAY BE REPEATED AS MANY TIMES AS DESIRED"
07310 PRINT "ALLOWING YOU TO CONSIDER A RANGE OF FORAGE YIELDS AND VALUES."
07320 REM---GO TO 09500 FOR TEST ONLY
07330 PRINT
07340 PRINT "***          ***          ***          ***          ***          ***          ***          ***"
07350 PRINT
07360 E(15) = G(15)
07370 IF A3 = 4 THEN 07500
07380 PRINT "WHAT PROBABILITY WOULD YOU ASSIGN THE EVENT OF A FIRST YEAR"
07390 PRINT "    SUCCESSFUL SEEDING (FOR EXAMPLE, IF THIS PROBABILITY IS 75 %"
07400 PRINT "    YOU WOULD TYPE IN 75).";
07410 INPUT E9
07420 E9=E9/100
07430 PRINT
07440 IF E9 >1 THEN 07470
07450 IF E9<0 THEN 07470
07460 GO TO 07490
07470 PRINT "ERROR, DATA ENTERED MUST BE BETWEEN 0 AND 100.  TRY AGAIN"
07480 GO TO 07390
07490 REM
07500 E(10)= 1 - E9
07510 PRINT "ENTER YOUR PREDICTED MAXIMUM HARVESTABLE FORAGE YIELD PER ACRE"
07520 PRINT "    IN YOUR RANGE IMPROVEMENT'S PEAK PRODUCTION YEAR (IN POUNDS)";

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07530 INPUT R1
07540 PRINT
07550 PRINT "ENTER YOUR PREDICTED LIFE OF THE IMPROVEMENT PROGRAM"
07560 PRINT " (FOR EXAMPLE, 25 - UP TO A MAX OF 40 YEARS)";
07570 INPUT R2
07580 IF R2 < 40 THEN 07610
07590 PRINT "** ERROR, DATA ENTERED MUST BE LESS THAN 40. TRY AGAIN.**"
07600 GO TO 07550
07610 PRINT
07620 PRINT "HOW MANY YEARS WILL YOUR IMPROVED RANGE BE HELD IN NONUSE"
07630 PRINT " FOLLOWING TREATMENT (IF NONE THEN TYPE 0)";
07640 INPUT R3
07650 PRINT
07660 PRINT "ENTER YOUR PREDICTED PER ANNU MARKET VALUE OF THE FORAGE REALIZED"
07670 PRINT " FROM RANGE IMPROVEMENTS (DOLLARS)";
07680 INPUT R4
07690 PRINT
07700 PRINT "ENTER YOUR PREDICTED ANNUAL INFLATION RATE OVER THE NEXT"(R2)
07710 PRINT " YEARS (FOR EXAMPLE, IF YOUR ESTIMATE IS 10 %, TYPE IN 10.0)";
07720 INPUT H8
07730 H8=H8/100
07740 PRINT
07750 PRINT
07760 DIM N(40)
07770 IF A3= 4 THEN 07790
07780 REM---INPUT PRODUCTION COEFFICIENTS INTO N MATRIX
07790 GO SUB 09430
07800 REM COMPUTE FORAGE VALUE MATRIX
07810 IF R3=0 THEN 07890
07820 IF R3=2 THEN 07860
07830 IF R3=3 THEN 07880
07840 N(1)=0
07850 GO TO 07890
07860 N(1)=N(2)=0
07870 GO TO 07890
07880 N(1)=N(2)=N(3)=0
07890 T= R2
07900 K=15
07920 REM FOR TEST THIS STATEMENT CAN BE ADDED----PRINT " A = ",A
07930 LET R6=(R1)/800
07940 L = R4
07950 T2=0
07960 FOR I= 1 TO T
07970 T2=T2+N(I)*R1
07980 N(I)= (N(I)*(R6))*(L)
07990 N(I)=N(I)-P(12)
08000 NEXT I
08010 F6=T2/R2
08020 F7=(T2-N(R3+1))/R2
08030 F8=F6+E9+F7*(1-E9)
08040 REM CALCULATE LAND TAX DIFFERENCES BETWEEN UNIMPROVED AND IMPROVED LAND
08050 REM

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08060 X=F6/800
08070 GOSUB 09550
08080 X(7)=X-X(5)
08090 X=F7/800
08100 GOSUB 09550
08110 X(8)=X-X(5)
08120 X=F8/800
08130 GOSUB 09550
08140 X(9)=X-X(5)
08150 FOR I=R3+1 TO R2
08160 IF D<0 THEN 08190
08170 N(I)=N(I)-X(7)
08180 GOTO 08200
08190 N(I)=N(I)-X(8)
08200 NEXT I
08210 R(3)=R(3)-N(14)
08220 REM FOR A TEST, CHANGE NEXT STATEMENT TO DO I=1 TO T
08230 REM AND CHANGE PRINT TO --- PRINT N(I); ----
08240 FOR I=1 TO 3
08250 PRINT
08260 NEXT I
08270 PRINT
08280 REM INTERNAL RATE OF RETURN COMPUTATIONS
08285 A= (E(15)-H(14))*(-1)
08290 D=.1
08300 FOR J= 1 TO K
08310 LET S1 = 0
08320 LET S3 = 0
08330 FOR I = 1 TO T
08340 LET S1= S1+N(I)*((1+D)**(-I))
08350 LET S2= (-I)*((1+D)**(-I-1))
08360 LET S3= S3+S2*N(I)
08370 NEXT I
08380 LET D1= A+S1
08390 LET D2= D1/S3
08400 LET D3= D-D2
08410 LET D= D3
08420 NEXT J
08430 H9=(D+H8+(H8*D))
08440 IF A3 = 4 THEN 08610
08450 RESTORE
08460 IF E(15)=(G(15)+Z(13)) THEN 08510
08470 E(15)=G(15)+Z(13)
08480 D8=D
08490 D7=H9
08500 GO TO 07760
08510 D9=D
08520 D6=H9
08530 REM COMPUTE EXPECTED TOTAL INVESTMENT
08540 E(11) = E9 * (G(15))
08550 E(12) = E(10)+(G(15) +Z(13))
08560 E(13) = E(11)+E(12)

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08570 REM COMPUTE EXPECTED INTERNAL RATE OF RETURN
08580 F3=E9*D8
08590 F4=E(10)*D9
08600 F5=F3+F4
08610 REM
08620 J5 = E9*(H8 + D8+(H8*D8))
08630 J6 = E(10)*(H8 + D9+(H8*D9))
08640 J7 = J5 + J6
08650 REM PRINT INTERNAL RATE OF RETURN TABLE
08660 PRINT "TABLE 5. INTERNAL RATE OF RETURN WITH AN ESTIMATED"
08670 PRINT " PROJECT LIFE OF "(R2)" YEARS."
08680 GOSUB 09020
08690 PRINTUSING 09210
08700 PRINTUSING 09220
08710 PRINTUSING 09230
08720 GOSUB 09040
08730 PRINTUSING 09240,"TOTAL INVESTMENT PER ACRE"
08740 PRINTUSING 09250,"REQUIRED OVER LIFE OF THE"
08750 PRINTUSING 09260,"PROJECT (DOLLARS)",G(15),E(15),E(13)
08760 PRINT
08770 PRINT
08780 PRINTUSING 09240,"INTERNAL RATE OF RETURN"
08790 PRINTUSING 09260,"NOT ADJUSTED (%)",D8*100,D9*100,F5*100
08800 PRINT
08810 PRINT
08820 PRINTUSING 09240,"INTERNAL RATE OF RETURN"
08830 PRINTUSING 09260,"ADJUSTED FOR INFLATION (%)",D7*100,D6*100,J7*100
08840 PRINT
08850 PRINT
08860 PRINTUSING 09240,"AVERAGE ANNUAL FORAGE DURING"
08870 PRINTUSING 09260,"LIFE OF THE PROJECT (LBS)",F6,F7,F8
08880 PRINT
08890 PRINT
08900 PRINTUSING 09240,"INCREASED ANNUAL LAND TAX"
08910 PRINTUSING 09250,"BASED ON INCREASED "
08920 PRINTUSING 09260,"FORAGE ($) ",X(7),X(8),X(9)
08930 GOSUB 09100
08940 PRINT "WOULD YOU LIKE TO RECOMPUTE THE INTERNAL RATE OF RETURN TABLE"
08950 PRINT " WITH DIFFERENT VALUES (1=YES, 0=NO)";
08960 INPUT C
08970 PRINT
08980 E(15)=0
08990 IF C=0 THEN 09010
09000 GO TO 07330
09010 STOP
09020 PRINT
09030 PRINT
09040 GOSUB 09150
09050 RETURN
09060 GOSUB 09150
09070 PRINT
09080 PRINT

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09090 RETURN
09100 GOSUB 09150
09110 FOR I8=1 TO 7
09120 PRINT
09130 NEXT I8
09140 RETURN
09150 PRINT "-----"
09160 RETURN
09170 FOR I8=1 TO 10
09180 PRINT
09190 NEXT I8
09200 RETURN
09210:                INITIAL        INITIAL        EXPECTED
09220:                SEEDING        SEEDING        BASED ON
09230:                SUCCESS        FAILURE        PROBABILITY
09240:#####
09250: #####
09260: #####.##      #####.##      #####.##
09270 REM----THE FOLLOWING ARE INPUT FOR A TEST ONLY--WILL NOT AFFECT
09280 REM----THE PROGRAM DURING A NORMAL RUN
09290 READ A1,G(28),G(29),A2,T1,A3,M(30),B1,B2
09300 READ C1,D1,C2,D2,E1,E2,X1,B4,C4,D4,E4
09310 READ M(10),M(11),U(21),F1,F2,F3,X4,Y#
09320 READ F4,F5,F8,F9,H1,H2,H3,H4,H5,H6,H7
09330 READ G7,G8,G9,G(10),G(11),G(12),M(12)
09340 READ M(13),M(14),G(24),G(25),G(30)
09350 DATA 450, 18, 0.05556, .13, .035, 1, 1, 15000, 4500
09360 DATA 0.75, 450, .85, 275, 385, 125, 0, 18000, .9, 385, 300
09370 DATA 0, 850, 1.89, 4.5, 3.2, 1.04, 1, "GALLON"
09380 DATA 8.56, .45, 4.15, 95, 5, 3.6, 1.05, 6, .75, 4.25, 85
09390 DATA 1, 3.25, 1, 2.5, 1350, 45, 1
09400 DATA 3200, 7.11, 150, .3333, 2.25
09410 GOTO 03260
09420 REM---INPUT THE N MATRIX (.1,.4,1.0,.96,.96,.....,.96)
09430 N(1)=.1
09440 N(2)=.4
09450 N(3)=1.0
09460 FOR I=4 TO 40
09470 N(I)=.96
09480 NEXT I
09490 RETURN
09500 E(15)=G(15)
09510 READ E9,R1,R2,R3,R4,H8
09520 DATA .7, 380, 28, 2, 3.00, .10
09530 E(10)=1-E9
09540 GOTO 08285
09550 REM DETERMINE LAND TAX CLASSIFICATION AND AMOUNT OF TAX
09560 REM
09570 IF X<1/4 THEN 09600
09580 X=X(1)
09590 GOTO 09670
09600 IF X<1/6 THEN 09630

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09610 X=X(2)
09620 GOTO 09670
09630 IF X<1/12 THEN 09660
09640 X=X(3)
09650 GOTO 09670
09660 X=X(4)
09670 X=X*T1
09680 RETURN
READY.