

**A Microcomputer Based Planning and
Budgeting System for Agricultural
Research Programs**

by

**Daniel C. Goodman, Jr., Thomas C. Stilwell,
and P. Jordan Smith**

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**A MICROCOMPUTER BASED PLANNING AND
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RESEARCH PROGRAMS***

By

Daniel C. Goodman, Jr., Thomas C. Stilwell
and P. Jordan Smith

Department of Agricultural Economics
Michigan State University

1985

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PREFACE

There is a worldwide revolution in small computer technology underway and scientists are struggling to find ways to utilize this new technology to help solve development problems in the Third World. We are pleased to announce a number of papers on microcomputers in international agriculture will be published in our International Development Papers series. The aim of these papers is to provide timely information about the rapidly changing state of the new micro-processing technology and its use in research. The papers are also intended as guides to agricultural and social scientists on choosing, installing, and maintaining microcomputer hardware and software systems in developing countries.

The present paper is published jointly with The Committee on Agricultural Research System Organization and Management (CARSOM) at MSU. The committee was established in September 1981 as an interdepartmental unit under the auspices of the Institute of International Agriculture. Its purpose has been to coordinate and facilitate research and teaching activities concerning the issues and problems in improving the organization and management of agricultural research systems in developing countries.

This working paper by Mr. Dan Goodman deals with an important management constraint commonly found in many developing country research programs i.e. limited ability to plan, budget, and monitor research activities and expenditures. The use of the microcomputer to help perform these tasks is an important breakthrough for management. The program presented here can be adapted to a national commodity or farming system research program, a regional research station, or a national research system.

Mr. Goodman was a Ph.D. candidate in the Department of Management at MSU and a member of CARSOM when this paper was written. He has since taken a position in Niamey, Niger as financial and administrative officer for ICRISAT in West Africa. Dr. Thomas Stilwell was an agronomist and computer specialist in the Department of Agricultural Economics at MSU and Mr. Jordan Smith is an undergraduate research assistant. MSU Title XII strengthening grant funds from USAID were used to support Mr. Goodman's work. Dr. Stilwell received support under the USAID funded Senegal Agricultural Research and

Planning Project and the Alternative Rural Development Strategies Cooperative Agreement.

Darrell F. Fienup
Chair (CARSOM)

Michael T. Weber
Co-Editor

April 1985

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A MICROCOMPUTER BASED PLANNING AND BUDGETING SYSTEM FOR AGRICULTURAL RESEARCH PROGRAMS

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A MICROCOMPUTER BASED PLANNING AND
BUDGETING SYSTEM FOR AGRICULTURAL
RESEARCH PROGRAMS

Daniel C. Goodman Jr.

This paper presents a prototype model for a microcomputer generated integrated planning, budgeting, reporting and management information system (PBRMS) suitable for agricultural research organizations in developing countries. The prototype was developed using a KAYPRO II microcomputer together with the commercially available software Perfect Calc and Perfect Writer. The preparation of this paper was made possible through the support of Michigan State University's Committee on Agricultural Research System Organization and Management (CARSON). Receipt of this support is gratefully acknowledged.

1.0 BACKGROUND

This paper is based on the proposition that sound research organization structures and administrative procedures are necessary prerequisites for achieving agricultural research objectives. A great deal of effort and funding by international agencies has been devoted to the technical aspects of agricultural research, e.g. the development and support of the CGIAR System and the training of developing country nationals in breeding, agronomy, entomology, etc. Conversely, little effort has been devoted to the improvement of the management and administration of national agricultural research systems.

Although there is great diversity in the way agricultural research is structured in developing countries, there appear to be a number of common managerial and administrative problems which affect the conduct of such research in a developing country context. For example, virtually all agricultural research in developing countries is conducted by government agencies. Those interested in the organization, administration and management of agricultural research may, therefore, find the literature on the management of non-profit enterprises to be particularly relevant, as, for example, the excellent article by Newman and Wallender (1978).¹ Among the

¹Newman, William H., and Wallender, Harvey W., "Managing Not-for-Profit Enterprises," Academy of Management Review, Vol. 3, No. 1, January 1978, pp. 24-31.

constraints mentioned by Newman and Wallender that cause unusual managerial problems in non-profit organizations, two are especially relevant to agricultural research organizations in developing countries. First, organization performance is inherently difficult to measure. In addition, the influence exerted on research organizations by a major segment of their clientele, namely, small, poor and largely uneducated farmers, is extremely weak.

Another common feature of agricultural research organizations in developing countries is the lack of adequate resources, both human and financial, to address the seeming endless list of research problems. The implications seem clear. Resources devoted to research should be concentrated on the highest priority problems and the financial requirements of the research effort should be clearly specified. Concerning the latter problem, the current budget allocation process in many developing countries often results in the research organization receiving only enough funds to pay staff salaries. Little or nothing is left to support experimental programs, let alone to develop the necessary research facilities and support units.

Finally, agricultural research organizations share the common feature of field trials. Even theoretical, laboratory or screen/greenhouse research designed for use by farmers must eventually be tried in the field. Field trials present management problems because a coordinated set of trials commonly must be conducted at several different research stations. The limited resources of both the trial coordinator and various station managers must accordingly be interlinked. This can lead to conflicts of managerial jurisdiction.

In summary, common managerial and organizational problems which should be addressed to improve the performance of agricultural research organizations in developing countries include introducing methods for evaluating performance, focusing scarce resources on the most critical research problems, clarifying financial inputs required to support various levels of research effort, and addressing the jurisdictional problems which often arise when coordinated field trials are carried out at several research stations. It is suggested that the use of relatively inexpensive, reliable microcomputer systems together with powerful user-friendly software packages can greatly facilitate the development and implementation of

improved planning, budgeting, reporting and management information systems (PBRMS) designed to address the above problems.

2.0 RESEARCH ORGANIZATION

The purpose of a PBRMS is to assist management in planning and controlling organizational activities to achieve the organization's objectives. To develop an effective PBRMS the organization must first establish a well-defined set of objectives and clear division of responsibilities. The problem of defining the objectives of an agricultural research organization is complex and requires serious study. For the purpose of this paper, however, research organizations are assumed to hold the simplified objectives of developing, documenting and demonstrating improved farming practices designed to overcome the major biological, social and economic constraints faced by a nation's farmers. This paper also assumes that the national research system is organized into the four components or divisions for administration, research support, research stations and research. This is shown in Figure 1. The PBRMS model which follows, however, can be readily adapted for use in more complex serious of objectives and institutional structures.

It should be emphasized that Figure 1 is an attempt to group major activities of agricultural research into logical organizational units and to impose some structure on these activities as a point of departure for development of a PBRMS. This structure is not intended to be a recommendation for how research should be organized. It is hoped that by presenting a hypothetical and simplified research organization, and then developing a PBRMS to fit this organization, the reader will gain some understanding of how a PBRMS might be adapted to fit different organizational structures.

The major features of the hypothetical research organization shown in Figure 1 can be outlined as follows.

The administration division handles major procurements, professional personnel records, accounting and includes the PBRMS support unit. For planning and budget purposes, this division would also include the national research leadership. This includes the national director, the deputy director and chiefs of the various divisions.

Research support encompasses library and documentation services, communications and publications, statistics, plant and soil laboratories

and other units which provide support to the research effort. Whereas each of these units should have its own head, the chief of research support holds overall planning, coordination and control responsibilities for the entire division.

The research stations are functionally organized, that is, organized around the main station responsibilities of research, land management, equipment use and maintenance, short term personnel management, station accounting, local purchases, maintenance of station buildings and facilities, etc. An important feature of this organizational design is that research station managements hold no responsibility for the direction of research undertaken at their respective locations. Rather they are primarily responsible for providing services and support to research projects and to research support units which may be located at their respective stations. While station management personnel with appropriate expertise may participate in the execution of research trials, the responsibility for the direction of research rests with the research division described below.

There are a number of ways to organize a research division. These include the commodity approach wherein researchers are assigned to work on specific commodities across various geographical areas, the geographic approach whereby researchers undertake research across various crops within a certain geographical area, and the research project approach where researchers are assigned to one or more specific research problems specific to a crop and a geographic area. The following description of a PBRMS assumes research divisions are organized by projects. This mode of organization has been chosen in the belief that most developing countries do not have adequate manpower to ensure that the important disciplines such as agronomy, breeding, entomology, economics, etc. are represented for either every important commodity or geographic area.

The effectiveness of each project team requires a careful definition of the specific problem or research objective to be addressed. Broadly posited objectives such as "increasing the production of corn" or simply "corn improvement" invariably lead to a proliferation of disjointed and poorly planned research activities rather than the more disciplined, coordinated effort required to make decisive progress. Research objectives should be selected to address problems which can be expected to be solved

within a three to five year time frame. They should aim to resolve a major production problem while accounting for the constraints of limited organizational funding and manpower. Examples of research objectives around which project teams could be assembled might be "the identification of genetic sources of resistance to maize streak virus", or "the identification of maize varieties and practices suitable for rotation with cotton in Northern Cameroon" or "the identification and treatment of a leaf yellowing disease associated with the production of cocoa yam". Those concerned with the crucial problem of setting effective research objectives may find an article by Granger (1964)¹ to be informative.

This paper also assumes that research objectives will be reviewed at an annual planning meeting. Such a meeting would ideally take place after the results of the previous cropping season so that decisions taken can be immediately implemented. In this forum, progress on existing research projects can be periodically reviewed. Those projects which are, or can be placed, "on track" would be reconstituted for the next season. Those projects which do not appear to be productive can be dissolved. As funding and manpower become available new projects can be initiated. To be approved, a research project would require a three to five year plan indicating how its objective is to be achieved, i.e. the research strategy, the trials needed, locations at which these trials are to be conducted, the data expected and the analyses required. A project would be constituted (or reconstituted) for the coming season when a budget is approved, a project leader designated and professional manpower assigned.

3.0 THE PLANNING, BUDGETING, REPORTING AND MANAGEMENT INFORMATION SYSTEM (PBRMS)

A microcomputer based PBRMS has been designed to serve the organizational and administrative research structure outlined above. This system has been developed with readily available microcomputer hardware and user friendly software. Its implementation requires only minimal training. Any individual already familiar with the use of spreadsheets should be able to establish this system on the basis of the information contained in this report alone.

¹Granger, Charles H., "The Hierarchy of Objectives," Harvard Business Review, Vol. 42, No. 3, May-June 1964, pp. 63-74.

As noted above, a PBRMS is essentially a management tool. Hence it should be designed to serve the needs of the organization's research leadership. Although the research leadership should be closely involved in defining the specific structure and function of any given PBRMS, the PBRMS unit, that is, the hardware, software and day to day operation of the PBRMS should be an independent part of the organization's administrative division.

3.1 Advances in Microcomputer Technology and Commercial Software

The planning, budgeting, reporting and management information system presented in this paper was designed on a Kaypro II microcomputer. This machine is a bundled portable type with the CPU (64 K RAM), screen, keyboard and two 5 1/4 inch disk drives each with 190 K storage capacity all incorporated into one unit. It uses the CP/M operating system. This is just one of a large number of suitable microcomputers on the market. One advantage of the Kaypro II is that it is generally sold complete with several powerful, user friendly software packages, including a word processing program, Perfect Writer, and a spreadsheet program, Perfect Calc. The U.S. price for the computer and software in late 1983 was about \$1600.

Perfect Calc was the software package used to develop the PBRMS presented in this paper and Perfect Writer was used to print out the final spreadsheets. Although there are dozens of commercially available spreadsheet programs, Perfect Calc is one of the few which enable various spreadsheets to be linked, a powerful feature which will be explained later. The popular literature on microcomputer software indicates that several other spreadsheets offer this linking feature, among these being MasterCalc, PeachCalc, Multiplan and Supercalc 3. Those interested in spreadsheet features may wish to review articles by Exner¹ (1983), Heintz² (1983) and Edwards and Graham³ (1983).

¹Exner, Ron, "Multiplan Spreadsheet," Interface Age, vol. 8 no. 7, July 1983, pp. 38-43.

²Heintz, Carl, "Seeking Solutions with Spreadsheets," Interface Age, vol. 8, no. 9, September 1983, pp. 52-59.

³Edwards, John and Graham, Patricia, "Buyer's Guide to Electronic Spreadsheet Programs," Desktop Computing, vol. 3, no. 7, July 1983, pp. 38-43.

3.2 Planning and Budgeting

A key feature of planning and budgeting within the PBRMS presented here is that costs are divided into those which are fixed and those which are variable. Fixed costs are defined as those costs which would be incurred if the research organization undertook no experiments or trials. The major fixed cost category would be permanent staff salaries as it is likely that if the research organization did no research, the staff would continue to be paid. Variable costs (perhaps a more appropriate word would be discretionary costs) are simply those which change with the number and types of experiments conducted. The idea of fixed and variable cost budgeting is to assist national research organizations overcome the problem of only receiving enough funds to pay staff salaries and other fixed costs with little, if any, funds left to support an experimental trials program. The research leadership needs to know where the fixed cost limit is so they can determine the size of the experimental trials. The major fixed cost category would be permanent staff salaries as it is likely that if the research organization did no research, the staff would continue to be paid. Variable costs (perhaps a more appropriate word would be discretionary costs) are simply those which change with the number and types of experiments conducted. The idea of fixed and variable cost budgeting is to assist national research organizations overcome the problem of only receiving enough funds to pay staff salaries and other fixed costs with little, if any, funds left to support an experimental trials program. The research leadership needs to know where the fixed cost limit is so they can determine the size of the experimental trials effort. This fixed and variable cost information would also be useful in budget discussions with government officials responsible for funding the national research effort.

Budgets are initially developed for each organizational unit and consolidated into divisional budgets and an overall budget using Perfect Calc's linking capabilities. The process can best be explained by examples based on the organization chart shown in Figure 1.

Starting with the Research Support Division, Figures 2 and 3 show possible budgets for the library and soils laboratory respectively. Perfect Calc, like most spreadsheet programs, provides the user with wide flexibility in designing budget formats and enables the user to perform certain operations

easily. Each spreadsheet is divided into rows and columns, the former being identified by numbers and the latter by letters. The row and column identification system forms a template for spreadsheet development. The column letters and row numbers do not appear when the spreadsheets are printed out.

In Figures 2 and 3, it should be noted that the totals for each row are found in column n. One of the most powerful features of spreadsheets like Perfect Calc is their ability to rapidly update budgets to reflect changes. That is, mathematical relations among cells can be easily programmed into the spreadsheets. If, for example, Mme. Etoundi's salary in Figure 2 should be increased from 692/month, it would only be necessary, once the spreadsheet is set up, to substitute the 750 figure for the 692 figure in month 1. The computer will automatically replicate the 750 figure for the 12 months and update the various totals. This feature should greatly facilitate organizational planning.

Once a spreadsheet is designed and the desired numbers entered, the spreadsheet can be stored on an external storage medium. In the case of the Kaypro II, a 5 1/4 inch floppy disk may contain both the original working format and a budget suitable for printing of hard copies. Each spreadsheet is identified in storage by a user specified name of up to eight characters composed of either letters or numbers, so long as the first character is a letter. The library budget (Figure 2) has been named SU301 which stands for a support unit for budget year 1983, this particular unit (the library) is identified as number 1.

Both the library and soils laboratory, the latter named SU302, have been consolidated into a Research Support Division summary budget named SUSUM (Figure 4). The consolidation of the previous two budgets was facilitated by using Perfect Calc's linking capabilities. This summary budget has been designed to reflect the breakdown between fixed and variable costs. The linking expressions for this summary budget are indicated. In this case, the expression "su301[n9]" which follows the Prof. Personnel Library row means that the number in column n row 9 of the budget named SU301 (the library) should be placed in this position in the SUSUM summary budget. Similarly, the expression following the Prof. Personnel Soil lab row

means that the sum of the numbers in column n rows 9, 10, 11 and 12 of the budget named SU302 (the soil laboratory) should be aligned in this position in the SUSUM summary budget. When the SUSUM budget containing the formulas in Figure 4 is loaded into one of the Kaypro's 7 buffers, and the SU301 and SU302 budgets are loaded into two of the remaining buffers, a simple keystroke results in the automatic generation of the research summary budget which can then be printed out as shown in Figure 5. So long as the budget formats remain unchanged, changes in the library (SU301) and soil laboratory (SU302) budgets can be repeatedly made and a summary budget incorporating these changes can be generated automatically.

Figures 6, 7 and 8 provide examples of two research station budgets named ST301 (the Bata Station) and ST302 (the Kumbaya Station) and a summary budget for the research stations named STSUM. Again the procedure is to develop the spreadsheets for the individual stations, taking advantage of Perfect Calc's automatic replicating and calculating procedures, and then to develop the summary spreadsheet which will, when the linking procedures are followed, automatically consolidate figures from the individual station spreadsheets. In the examples given, the individual station spreadsheets have been developed with a fixed and variable cost breakdown. In addition, the ratios shown at the bottom of these examples illustrate other interesting calculations which can be automatically performed by Perfect Calc and other comparable spreadsheet programs. It should be noted that budget figures for land preparation, trial establishment and other trial costs are not included in the research station budgets. Rather, following the organizational scheme outlined in the initial part of this paper, these costs are included in the research project budgets.

Figures 9, 10 and 11 give examples of individual research project budgets. These budgets incorporate the fixed and variable cost division. Also, whenever practical they allocate the trial costs to the stations where the trials are to be carried out. Figure 12 is a summary of the individual research project budgets named RSUM. This has been generated using Perfect Calc's linking feature like the other summary budgets.

Figure 13 is an example of the Administrative Division's budget, named ASUM. Since the Administrative Division has not been broken down into individual units, this division is represented only by a summary budget.

The four division summary budgets, SUSUM, STSUM, RSUM and ASUM have been linked to form an overall budget summary named BUDGET83. The linking formulas and the result of the linking process are shown in Figures 14 and 15 respectively. This completes the examples of the budget development process.

3.3 Reporting and Management Information

The computerized budgeting scheme developed in this paper features an 8 character budget name together with a column letter and row number which permit one to readily identify any number of specific expenditures. For example, su30ln9 uniquely identifies professional personnel expenditures for the library. This feature coupled with spreadsheet design flexibility, the mathematical manipulations which can be built into any spreadsheet and Perfect Calc's linking feature allow the development of a variety of reporting and management information formats. Several examples are described below.

When the research projects are finalized, it may be useful to consolidate an estimate of the land and fertilizer required to support the research programs at each research station. Figure 16 shows the spreadsheet and formulas used to generate a consolidated research requirements statement for the Bata research station. When this spreadsheet is placed in one of Perfect Calc's buffers along with the various research project spreadsheets, a consolidated research requirements summary sheet is automatically generated. This is shown in Figure 17 as ST1REQS (Station 1 requirements).

Another useful type of summary might help research management to keep track of research project progress. The organizational scheme in this paper would have research station managements responsible for providing the land and labor needed to carry out the field trials for the various research projects. However, these field trial costs do not appear in the research station budgets. Instead, these costs are budgeted against the various research projects. With this scheme, simple procedures can be worked out whereby the research projects "pay" the research stations

for providing the needed land and other trial costs. In this case "payment" would be in the form of accounting transactions. If a research station carries out the land preparation, trial establishment and other trial operations to the satisfaction of the research project leader, the latter would authorize "payment" for these services. Recording such "payments" would give research management a convenient way to review research project progress.

Figure 18 is an example of a spreadsheet named R301STAT showing the progress or status of research project R301. Monthly reports of "payments" authorized by the leader of research project R301 at each research station are entered, and the percentage completions are automatically updated. Any discrepancies, for example the fact that only 25 percent of the trial establishment work for project R301 has been completed at Kumbaya as of the end of April when all the work should have been completed, can be queried by management. Of course, to be of value, reports of "payments" authorized must be submitted in a timely manner and applied to the appropriate spreadsheet.

4.0 CONCLUSION

This paper has described a hypothetical agricultural research organization and associated planning, budgeting, reporting and management information system (PBRMS) for use on microcomputers. The PBRMS was designed to fit the following organizational features:

- A. An organizational structure featuring four divisions; administration, research support, research stations and research.
- B. The budgets for all divisions divided into fixed and variable categories.
- C. The research division organized around problem solving project teams. Research projects to be constituted (or reconstituted) at an annual planning meeting.
- D. Research station managements held primarily responsible for providing services to research projects and research support units undertaking operations at their respective stations.

It should be emphasized, however, that the PBRMS can be adapted to fit a variety of organizational structures and administrative needs. The PBRMS design encompasses the following basic principles:

- A. This is essentially a management tool. Its effectiveness depends on its efficient employment to serve well specified managerial objectives.
- B. A PBRMS can be developed with a variety of microcomputer hardware and software, and is easily adaptable to local circumstances.
- C. Project or program budgets can be easily developed, compared, evaluated and changed to reflect an evolving perception of needs and priorities.
- D. The system can greatly facilitate improved program planning and accountability.

In sum, the PBRMS is inexpensive to construct and operate. Yet it provides the promise of substantial managerial returns.

APPENDIX

LINKING MORE THAN 6 SPREADSHEETS

As noted in the text, spreadsheets can only be linked when they are placed in one of Perfect Calc's 7 buffers. This means that a maximum of one summary spreadsheet filling one buffer and 6 other spreadsheets to be linked to the summary spreadsheet can be linked at one time.

Some special design considerations are required to circumvent the constraint entailed in the limited number of buffers. To illustrate one method, assume that one has the four divisions shown in figure 1 and 8 units under each division. The objective is to link each of the 8 units in each division to a division summary, and then to link the four divisions to an overall budget.

The first step would be to load one of the summary spreadsheets, say the administrative division's summary ASUM, into a buffer and then load in 6 of the 8 administrative units into the remaining 6 buffers. Once the 6 units are linked to the ASUM summary, the 6 buffers containing the administrative units are cleared and the 2 remaining administrative units are loaded into 2 of the 6 cleared buffers. When these 2 administrative units are linked to ASUM, all buffers except that containing ASUM are cleared. At this point, 1 buffer contains ASUM and the other 6 buffers are clear.

The next step would be to load another summary budget, say STSUM, into one of the 6 cleared buffers and then to load 5 of the 8 individual station budgets into the 5 remaining buffers. When these 5 station budgets are linked to STSUM, the 5 buffers containing them are cleared buffers. When these latter 3 station budgets are linked to STSUM, the 3 buffers containing them are cleared. At this point, 1 buffer contains ASUM, 1 buffer contains STSUM and the other 5 buffers are clear.

By a similar procedure, RSUM is loaded into one of the 5 clear buffers leaving 4 buffers which can be loaded with the 8 hypothetical research project budgets, 4 in the first instance and 4 in the second instance. After this process, 3 buffers will contain ASUM, STSUM, and RSUM leaving 4 buffers clear which can be used to link SUSUM with the 8 support unit budgets in a relay involving 3 units, then 3 units and finally 2 units. When this process is completed, 4 buffers will contain the 4 division summaries and 3 buffers

will be clear. The overall budget can then be loaded into 1 of the 3 clear buffers and the 4 summary budgets linked to the overall budget. At this point, the 4 summary budgets and the overall budget can be saved for future printing.

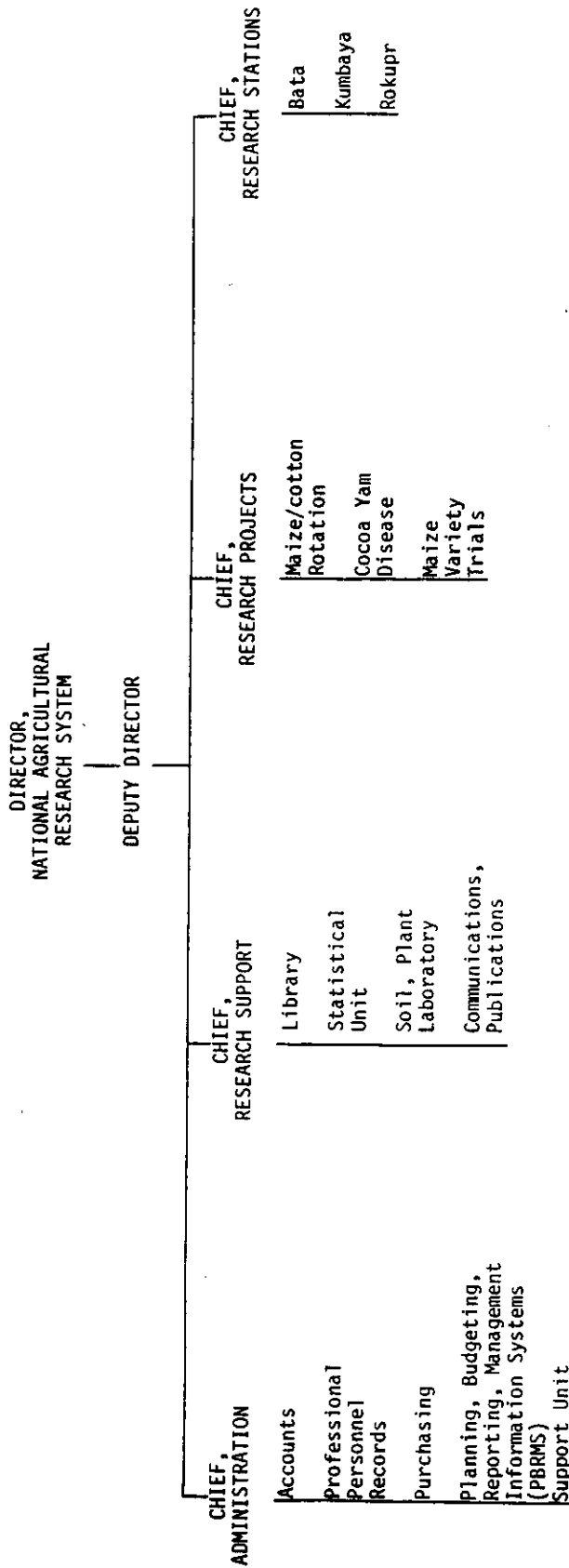


Figure 1

CODE: SU 301
 LIBRARY
 Mme. ETOUNDI
 TEL: 34865

BUDGET 1983

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
Prof. Personnel Mme. Etoundi	692	692	692	692	692	692	692	692	692	692	692	692	8,304
Other Cadres Mlle. Mba M. Fola	383 225	383 225	383 225	383 225	383 225	383 225	383 225	383 225	383 225	383 225	383 225	383 225	4,596 2,700
Supplies Office	100	100	100	100	100	100	100	100	100	100	100	100	1,200
Travel Prof. Meetings					800								800
Subscriptions Am. Soc. Agron. Phytopath News Acad. Mgt. Jrnl.	30						25						30 25 45
Capital Reading desks Typewriter File cabinets	800 425				600								600 800 425
TOTALS	2,655	1,400	1,400	1,400	2,800	1,445	1,425	1,400	1,400	1,400	1,400	1,400	19,525

Figure 2

CODE: Su 302
 SOILS LABORATORY
 DR. FADA
 TEL: 39213

BUDGET 1983

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
Prof. Personnel													
Dr. Fada	867	867	867	867	867	867	867	867	867	867	867	867	10,404
Dr. Smith	792	792	792	792	792	792	792	792	792	792	792	792	9,504
Mr. Hermes	692	692	692	692	692	692	692	692	692	692	692	692	8,304
Mr. Duncan	692	692	692	692	692	692	692	692	692	692	692	692	8,304
Other Cadres													
8 technicians	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	24,000
Supplies													
Office	100	100	100	100	100	100	100	100	100	100	100	100	1,200
Chemicals	1,400					1,400							2,800
Glassware	600												600
Travel													
Prof. Meetings													1,800
Soil collections		350	1,800	350			350		350				1,400
Capital													
Auto analyzer								4,200					4,200
HP 85 computer	3,700												3,700
TOTALS	10,843	5,493	6,943	5,493	5,143	6,543	5,493	9,343	5,493	5,143	5,143	5,143	76,216

Figure 3

SUMMARY
1983 BUDGET
RESEARCH SUPPORT

FIXED COSTS		Totals
Prof. Personnel		
Library	su301(n9)	
Soil Lab.	su302(n9)+su302(n10)+su302(n11)+su302(n12)	
Total Prof. Pers.		<u>b8+b9</u>
Other Staff		
Library	su301(n12)+su301(n13)	
Soil Lab.	su302(n15)	
Total Other Staff		<u>b13+b14</u>
TOTAL FIXED COSTS		c10+c15
VARIABLE COSTS		
Supplies		
Library	su301(n16)	
Soils Lab.	su302(n18)+su302(n19)+su302(n20)	
Total Supplies		<u>b22+b23</u>
Travel		
Library	su301(n19)	
Soils Lab.	su302(n23)+su302(n24)	
Total Travel		<u>b27+b28</u>
Subscriptions		
Library	su301(n22)+su301(n23)+su301(n24)	
Capital		
Library	su301(n27)+su301(n28)+su301(n29)	
Soils Lab.	su302(n27)+su302(n28)	
Total Capital		<u>b35+b36</u>
TOTAL VARIABLE COSTS		sum(c24:c37)
TOTAL ALL COSTS		c17+c39

Figure 4

CODE: SUSUM--SUMMARY
1983 BUDGET
RESEARCH SUPPORT

FIXED COSTS		Totals
Prof. Personnel		
Library	8,304	
Soil Lab.	36,516	
Total Prof. Personnel		<u>44,820</u>
Other Staff		
Library	7,296	
Soil Lab.	24,000	
Total Other Staff		<u>31,296</u>
TOTAL FIXED COSTS		76,116
<hr/>		
VARIABLE COSTS		
Supplies		
Library	1,200	
Soils Lab.	4,600	
Total Supplies		<u>5,800</u>
Travel		
Library	800	
Soils Lab.	3,200	
Total Travel		<u>4,000</u>
Subscriptions		
Library		<u>100</u>
Capital		
Library	1,825	
Soils Lab.	7,900	
Total Capital		<u>9,725</u>
TOTAL VARIABLE COSTS		19,625
<hr/>		
TOTAL ALL COSTS		<u>95,741</u>

Figure 5

CODE: ST 301
 BATA STATION
 DR. KUNZI
 TEL: 689403

BUDGET 1983

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
FIXED COSTS:														
Prof. Personnel														
Dr. Kunzi	770	770	770	770	770	770	770	770	770	770	770	770	770	9,240
Dr. Awa	640	640	640	640	640	640	640	640	640	640	640	640	640	7,680
Dr. Dugbe	600	600	600	600	600	600	600	600	600	600	600	600	600	7,200
Mr. Onah	580	580	580	580	580	580	580	580	580	580	580	580	580	6,960
Other staff														
Techs. grade 7	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	19,200
Techs. grade 6	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	21,600
Techs. grade 5	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	16,800
Techs. below 5	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	15,000
Basic maintenance														
Grounds	300	300	300	300	300	300	300	300	300	300	300	300	300	3,600
Buildings	400	400	400	400	400	400	400	400	400	400	400	400	400	4,800
Vehicles, machinery	200	200	200	200	200	200	200	200	200	200	200	200	200	2,400
Infrastructure	200	200	200	200	200	200	200	200	200	200	200	200	200	2,400
Fields	500	500	500	500	500	500	500	500	500	500	500	500	500	6,000
Other expenses														
Office supplies	300	300	300	300	300	300	300	300	300	300	300	300	300	3,600
Electricity, water	240	240	240	240	240	240	240	240	240	240	240	240	240	2,880
Telephone, telex	150	150	150	150	150	150	150	150	150	150	150	150	150	1,800
Rents	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL FIXED COSTS	10,930	10,930	10,930	10,930	10,930	10,930	10,930	10,930	10,930	10,930	10,930	10,930	10,930	131,160
VARIABLE COSTS:														
Consultation travel			2,400						600					3,000
Capital														
Grounds														0
Buildings														0
Vehicles, machinery						17,000								17,000
Infrastructure														0
Fields			5,200											5,200
TOTAL VARIABLE COSTS	0	0	7,600	0	0	17,000	0	0	600	0	0	0	0	25,200
TOTAL COSTS	10,930	10,930	18,530	10,930	10,930	27,930	10,930	10,930	11,530	10,930	10,930	10,930	10,930	156,360
RATIOS BATA STATION														
Fixed to total costs	0.84													
Capital to total costs	0.14													

Figure 6

CODE ST302
KUMBAYA STATION
DR. ALVAREZ
TEL: 649871

BUDGET 1983

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
FIXED COSTS:													
Prof. Personnel													
Dr. Alvarez	683	683	683	683	683	683	683	683	683	683	683	683	8,196
Dr. Taki	600	600	600	600	600	600	600	600	600	600	600	600	7,200
Mr. Latiwura	540	540	540	540	540	540	540	540	540	540	540	540	6,480
Other staff													
Techs. grade 7	800	800	800	800	800	800	800	800	800	800	800	800	9,600
Techs. grade 6	340	340	340	340	340	340	340	340	340	340	340	340	4,080
Techs. grade 5	270	270	270	270	270	270	270	270	270	270	270	270	3,240
Techs. below 5	620	620	620	620	620	620	620	620	620	620	620	620	7,440
Basic maintenance													
Grounds	300	300	300	300	300	300	300	300	300	300	300	300	3,600
Buildings	150	150	150	150	150	150	150	150	150	150	150	150	1,800
Vehicles	100	100	100	100	100	100	100	100	100	100	100	100	1,200
Infrastructure	120	120	120	120	120	120	120	120	120	120	120	120	1,440
Fields	400	400	400	400	400	400	400	400	400	400	400	400	4,800
Other expenses													
Office supplies	200	200	200	200	200	200	200	200	200	200	200	200	2,400
Electricity, water	250	250	250	250	250	250	250	250	250	250	250	250	3,000
Telephone, telex	200	200	200	200	200	200	200	200	200	200	200	200	2,400
Rents	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL FIXED COSTS	5,573	5,573	5,573	5,573	5,573	5,573	5,573	5,573	5,573	5,573	5,573	5,573	66,876

VARIABLE COSTS:

Consultation travel					3,000									
CAPITAL														
Grounds													3,000	
Buildings													0	
Vehicles, machinery		40,000						4,000					0	
Infrastructure	8,000												4,000	
Fields													40,000	
													8,000	
													0	
TOTAL VARIABLE COSTS	8,000	40,000	0	0	3,000	0	0	4,000	0	0	0	0	55,000	
TOTAL COSTS	13,573	45,573	5,573	5,573	8,573	5,573	5,573	9,573	5,573	5,573	5,573	5,573	121,876	
RATIOS KUMBAYA STATION														
Fixed to total costs	0.55													
Capital to total costs	0.43													

Figure 7

CODE: STSUM--SUMMARY
 1983 BUDGET
 RESEARCH STATIONS

FIXED COSTS	Budget	Totals
Prof. Personnel		
Bata	31,080	
Kumbaya	21,876	
Total Prof. Personnel		<u>52,956</u>
Other Staff		
Bata	72,600	
Kumbaya	24,360	
Total Other Staff		<u>96,960</u>
Basic Maintenance		
Bata	19,200	
Kumbaya	12,840	
Total Basic Maintenance		<u>32,040</u>
Other Expenses		
Bata	8,280	
Kumbaya	7,800	
Total Other Expenses		<u>16,080</u>
TOTAL FIXED COSTS		<u>198,036</u>
VARIABLE COSTS		
Consultation Travel		
Bata	3,000	
Kumbaya	3,000	
Total Consultation Travel		<u>6,000</u>
Capital		
Bata		
Grounds	0	
Buildings	0	
Vehicles, Machinery	17,000	
Infrastructure	0	
Fields	5,200	
Kumbaya		
Grounds	4,000	
Buildings	40,000	
Vehicles, Maintenance	8,000	
Infrastructure	0	
Fields	0	
Total Capital		<u>74,200</u>
TOTAL VARIABLE COSTS		<u>80,200</u>
TOTAL COSTS		<u>278,236</u>
RATIOS STATION SUMMARY		
Fixed to Total Costs	0.71	
Capital to Total Costs	0.27	

CODE: R301
 MAIZE VARIETIES AND AGRONOMY
 FOR MAIZE COTTON ROTATION
 RESPONSIBLE: Dr. Kim

FIXED COSTS	RATES	FIXED COSTS	STATIONS					TOTALS
			UNALLOCATED	BATA	KUMBAYA	ROKUPR	GOMBE	
Prof. personnel								
Dr. Kim	.75 time	8,100						
Dr. Turkur	.20 time	1,740						
Total Fixed Costs		9,840						
VARIABLE COSTS	RATES	UNALLOCATED	BATA	KUMBAYA	ROKUPR	GOMBE	TOTALS	
Land preparation costs	\$150/ha		750	300	300		1,350	
Trial establishment	\$200/ha		1,000	400	400		1,800	
Fertilizers								
20-20-20	\$0.29/kg		348		139		487	
DAP	\$0.43/kg		0		0		0	
Potash	\$0.25/kg		100	40	40		180	
Urea	\$0.30/kg			120			120	
Trial maintenance	\$240/ha		1,200	480	480		2,160	
Trial visits		2,400					2,400	
Trial supplies			500	200	200		900	
Laboratory analyses		1,200					1,200	
TOTAL VARIABLE COSTS		3,600	3,898	1,540	1,559	0	10,597	
TOTAL COSTS		13,440	3,898	1,540	1,559	0	20,437	

Figure 9

CODE: R302
 GENETIC RESISTANCE TO
 MAIZE STREAK VIRUS
 RESPONSIBLE: Dr. Kim

FIXED COSTS		RATES	FIXED COSTS						
VARIABLE COSTS		RATES	UNALLOCATED	STATIONS	BATA	KUMBAYA	ROKUPR	GOMBE	TOTALS
Prof. personnel									
	Dr. Kim	.25 time	2,700						
	Dr. Turkur	.20 time	1,740						
Total Fixed Costs			4,440						
Land preparation costs		\$150/ha			1,500	300	300	300	2,400
Trial establishment		\$200/ha			2,000	400	400	400	3,200
Fertilizers									
	20-20-20	\$0.29/kg			696	139	139	0	974
	DAP	\$0.43/kg			0	0	0	120	120
	Potash	\$0.25/kg			100	40	40	40	220
	Urea	\$0.30/kg			0	0	0	0	0
Trial maintenance		\$240/ha			2,400	480	480	480	3,840
Trial visits			2,800						2,800
Trial supplies					500	200	200	200	1,300
Laboratory analyses			2,400						2,400
Total variable costs			5,200		7,196	1,559	1,559	1,740	17,254
TOTAL COSTS			9,640		7,196	1,559	1,559	1,740	21,694

Figure 10

CODE: R303
 COCOA YAM YELLOWING
 DISEASE PROBLEM
 RESPONSIBLE: Dr. Banjo

FIXED COSTS	RATES	FIXED COSTS	STATIONS					TOTALS
			BATA	KUMBAYA	ROKUPR	GOMBE		
Prof. personnel Dr. Banjo	1.00 time	8,200						
Total Fixed Costs		8,200						
VARIABLE COSTS	RATES	UNALLOCATED	STATIONS					TOTALS
Land preparation costs	\$150/ha					900	900	
Trial establishment	\$200/ha					1,200	1,200	
Fertilizers								
20-20-20	\$0.29/kg					0	0	
DAP	\$0.43/kg					258	258	
Potash	\$0.25/kg					42	42	
Urea	\$0.30/kg					0	0	
Trial maintenance	\$240/ha					1,440	1,440	
Trial visits		2,400				0	2,400	
Trial supplies						400	400	
Laboratory analyses						5,200	5,200	
Total variable costs		2,400	0	0	0	9,440	11,840	
TOTAL COSTS		10,600	0	0	0	9,440	20,040	

Figure 11

CODE: RSUM--SUMMARY
1983 BUDGET
RESEARCH PROJECTS

FIXED COSTS	Budget	Totals
Prof. Personnel		
Project R301	9,840	
Project R302	4,440	
Project R303	8,200	
Total Prof. Personnel		
TOTAL FIXED COSTS		22,480
<hr/>		
VARIABLE COSTS		
<hr/>		
Land Preparation	4,650	
Trial Establishment	6,200	
Fertilizers		
20-20-20	1,461	
DAP	378	
Potash	442	
Urea	120	
Trial Maintenance	7,440	
Trial Visits	7,600	
Trial Supplies	2,600	
Laboratory Analyses	8,800	
TOTAL VARIABLE COSTS		39,691
<hr/>		
TOTAL COSTS		62,171
<hr/>		
RATIOS RESEARCH SUMMARY		
Fixed to Total Costs	0.36	

Figure 12

CODE: ASUM
ADMINISTRATIVE COSTS
SUMMARY
1983 BUDGET
Responsible: Dr. Achola

FIXED COSTS	Budget	Totals
Prof. Personnel		
Dr. Achola	14,400	
Dr. Temke	11,600	
Mr. Kolawole	10,400	
Total Prof. Personnel		<u>36,400</u>
Other Staff		
Techs. Grade 7	13,200	
Techs. Grade 6	5,500	
Techs. Grade 5	0	
Techs. Below 5	19,200	
Total Other Staff		<u>37,900</u>
Other Expenses		
Office Supplies	5,000	
Telephone, Telex	4,000	
Total Other Expenses		<u>9,000</u>
TOTAL FIXED COSTS		83,300
<hr/>		
VARIABLE COSTS		
<hr/>		
Consultation Travel		<u>9,000</u>
Capital		
Copy Machine	6,800	
Micro-computer	7,500	
Total Capital		<u>14,300</u>
TOTAL VARIABLE COSTS		23,300
<hr/>		
TOTAL COSTS		106,600
<hr/>		
RATIOS ADMIN SUMMARY		
Fixed to Total Costs	0.78	

Figure 13

CODE: BUDGET83
AGRIC. RESEARCH INSTITUTE
1983 BUDGET

FIXED COSTS	BUDGET
Administration	asum(c27)
Support Units	susum(c17)
Research Stations	stsum(c27)
Research Projects	<u>rsum(c13)</u>
TOTAL FIXED COSTS	sum(b7:b13)

VARIABLE COSTS	
Administration	asum(c38)
Support Units	susum(c39)
Research Stations	stsum(c51)
Research Projects	<u>rsum(c36)</u>
TOTAL VARIABLE COSTS	sum(b19:b25)

TOTAL COSTS	b15+b27
-------------	---------

1983 BUDGET RATIOS	
Fixed to Total Costs	b15/b29

Figure 14

CODE: BUDGET83
AGRIC. RESEARCH INSTITUTE
1983 BUDGET

FIXED COSTS	BUDGET
Administration	83,300
Support Units	76,116
Research Stations	198,036
Research Projects	<u>22,480</u>
TOTAL FIXED COSTS	379,932
VARIABLE COSTS	
Administration	23,300
Support Units	19,625
Research Stations	80,200
Research Projects	<u>39,691</u>
TOTAL VARIABLE COSTS	162,816
TOTAL COSTS	542,748
1983 BUDGET RATIOS	
Fixed to Total Costs	0.70

Figure 15

CODE: STIREQS
 STATION 1--BATA
 RESEARCH REQUIREMENTS
 1983 BUDGET

RESEARCH PROJECT	R301	R302	R303	TOTALS
REQUIREMENTS				
Land Preparation--hectares	r301(e16)/150	r302(e16)/150	r303(e16)/150	sum(b10:d10) hectares
Fertilizers--kgs.				
20-20-20	r301(e21)/.29	r302(e21)/.29	r303(e21)/.29	sum(b13:d13) kgs.
DAP	r301(e22)/.43	r302(e22)/.43	r303(e22)/.43	sum(b14:d14) kgs.
Potash	r301(e23)/.25	r302(e23)/.25	r303(e23)/.25	sum(b15:d15) kgs.
Urea	r301(e24)/.3	r302(e24)/.3	r303(e24)/.3	sum(b16:d16) kgs.

Figure 16

CODE: ST1REQS
STATION 1--BATA
RESEARCH REQUIREMENTS
1983 BUDGET

RESEARCH PROJECT	R301	R302	R303	TOTALS
REQUIREMENTS				
Land Preparation--hectares	5	10	0	15 hectares
Fertilizers--kgs.				
20-20-20	1,200	2,400	0	3,600 kgs.
DAP	0	0	0	0 kgs.
Potash	400	400	0	800 kgs.
Urea	0	0	0	0 kgs.

Figure 17

CODE: R301STAT--STATUS
 MAIZE VARIETIES AND AGRONOMY
 FOR MAIZE COTTON ROTATION
 RESPONSIBLE: Dr. Kim

STATIONS	Bata	Kumbaya	Rokupr	Gombe	Totals
LAND PREPARATION					
Completion Date	15 March	30 March	15 April		
Land Preparation Costs	750	300	300		1,350
Number of Hectares	5	2	2		9 hectares
Payments Made to 31 March	600	200	0		800
Payments Made April	150	100	150		400
Payments Made May					0
Percentage Completed	100	100	50		83
TRIAL ESTABLISHMENT					
Completion Date	15 April	30 April	15 May		
Trial Establishment Costs	1,000	400	400		1,800
Payments Made to 31 March	0	0	0		0
Payments Made April	500	100	0		600
Payments Made May					0
Payments Made June					0
Percentage Completed	50	25	0		25
TRIAL MAINTENANCE					
Completion Date	15 July	30 July	15 August		
Trial Maintenance Costs	1,200	480	480		2,160
Payments Made to 30 June					0
Payments Made July					0
Payments Made August					0
Payments Made September					0
Percentage Completed	0	0	0		0

Figure 18

ADAPTATION OF RESEARCH MANAGEMENT SYSTEM TO SUPERCALC
Thomas Stilwell and Jordan Smith

This section describes an adaptation of the basic Perfect Calc templates to SuperCalc (version 1.12). Even though the appearance of some of the templates differ from those of Goodman, their function and contents are similar.

There are a total of 7 templates in this adaptation. They are:

- Standard Budget Worksheet
- Experiment Budget Worksheet
- Standard Variable Expense Summary
- Experiment Variable Expense Summary
- Experiment General Expense Summary
- Personnel and Capital Summary
- Budget Summary

The first two are the basic formats used for all budgets done by individual units such as a library, maize breeding program, soil testing laboratory, etc. The remaining five templates form summaries of different parts of the two basic templates. Samples are given of each one of these budget templates plus a listing of all the keystrokes needed to form the templates. In addition partial formula listings are given for the two basic worksheets. Diagrams are included for the summary templates showing the methodology of combination used. Because the summaries utilize 'summary blocks' from the two basic worksheets it is possible to form Budget Summaries from any combination of the worksheets. This feature permits the templates to be used in various administrative structures. For example, these templates can be used for a research program with personnel in various experiment stations or experiment stations that include research programs in their budgets. A description of each template follows along with suggestions and precautions for modifications.

INDIVIDUAL BUDGETS

A budget for an individual program or section of an experiment station is formed by loading the appropriate template (Experiment or Standard). In necessary changes are made in column names and row titles to reflect the budget being formed. Data is entered as with any normal budget worksheet and the totals calculated. When the budget has been refined to its final

form it is saved using a file name such as ADMIN, WHEAT or SOILS, etc. Changes or refinement of an individual budget can be done by loading the appropriate program budget (i.e. ADMIN, WHEAT or SOILS) and entering new figures.

Standard Budget Worksheet (Figures 1 and 2)

The Standard Budget Worksheet is composed of five sections. The instructions are placed so that they are the first to appear on the screen after the template is loaded. These instructions can be changed without any effect on the operation of the worksheet.

The Summary Budget Worksheet is composed of five sections. The instructions are placed so that they are the first to appear on the screen after the template is loaded. These instructions can be changed without any effect on the operation of the worksheet.

The Summary Budget shows the sums of selected categories plus total man/years and program name. Extra items can be added but this should be done with care. See the description of the Budget Summary template for more information. Because of the worksheet totals are calculated by columns from left to right, all calculations must be done twice. If they are not done twice then the Summary Budget will be wrong and all summaries will also be wrong. (This is done in Super Calc by pressing ! two times.)

The Permanent Personnel Budget is intended to show the amount of resources committed to permanent staff. It permits partial allocation of an individual's time. Only the persons name, yearly salary and percent time allocation need be entered. The total cost is calculated by the worksheet. As many as 14 names can be entered here. More names can be entered only after modifying the Personnel Summary template.

The Capital Expenses Budget is reserved for the purchase of items such as desks, tractors, air conditioners, etc. The major difference between items in this section and the following Variable Expense Budget is that the Capital Expense Budget is not divided into time periods. The name of the item and its cost must be entered and the total is then calculated. Up to 14 items can be entered. More items can be entered only after modifying the Capital Budget Summary Worksheet. If budget classifications are used in place of individual items, this will be shown in the Capital Summary Budget.

The Standard Variable Expense Budget is intended to be used for all other expenses not included in previous sections. Although it is divided into 12 months, it could just as easily be divided into quarters or semesters without affecting the summary worksheets. However, the first and last columns must occur in the same positions or the summary worksheets cannot be calculated. Space for 55 items is provided. More items can be added only after modifying the Standard Materials summary template. To permit calculation of a summary worksheet from this data it is necessary that the Variable Budget rows in all Standard Worksheets have the same names and order. At the end of this section are monthly totals and a few ratios useful for budget evaluation. Both the name of the line item and the estimated monthly totals must be entered manually. The totals and ratios are then calculated by the computer. Changes in the proposed budget are made by changing any of the basic data and recalculating the totals twice. The calculations must be made twice or the summary budgets will not be correct.

Experiment Budget Worksheet (Figures 3 and 4)

The Experiment Budget Worksheet is designed especially for preparation of budgets of field research programs such as plant breeding or agronomy trials. The Instructions, Summary Budget, Permanent Personnel Budget and Capital Expenses Budget are nearly identical to those of the Standard Worksheet. The major differences occur in the Experiment Variable Expense Budget.

The Experiment Variable Expenses are divided into two sections: those expenses which can be directly attributed to an individual experiment and other expenses which cannot be easily divided among individual experiments. The first section has been called Experiment Variable Expense Budget while the second has been named Experiment General Expense Budget. Any other names can be used as desired.

The user must first fill in a 3 line name for each type of experiment to be planted plus the surface area occupied by each experiment in a single location. Then the total number of locations are entered for each type of experiment. The materials used for each location planted for this experiment are then entered on each line. Both the amount of a material used for planting one location plus its unit price are entered. Up to 17 items can be entered without modifying the Variable Expense Summary template.

The Experiment General Expense Budget section only needs an estimate of the cost per hectare of each line item. While estimating some items on a per hectare basis may seem strange, many programs do this. It is an attempt to prorate the budget expenses according to the total amount of field work programmed. Up to 16 items can be entered without modifying the Experiment General Expense Summary template.

After these items are filled in all other totals are calculated. Both total quantity and total costs of each item of materials are calculated. Ratios are also calculated to illustrate the allocation of budgeted funds.

Adjustments in the budget can be made through changes in the locations to be planted or unit prices of materials. By increasing or decreasing the number of locations for a certain type of experiment the total for variable expenses will be increased or decreased. Reducing locations to zero means the experiment will not be planted.

COMBINING BUDGETS

The formation of summary budgets is done by taking a portion of several individual budgets and loading these portions into a summary template. For example, the General Summary Budget is formed by loading the figures from the Summary block of ADMIN, WHEAT and SOILS into an empty General Summary template. Any spreadsheet with the ability to combine part of one template with another can accomplish this. In this adaptation the commands needed to accomplish this are shown in the command listings. The files to be combined are shown in darker print. The actual file names will be the names of the individual budgets previously saved. Although this combining could be done manually, Super Calc permits use of command files which accomplish this automatically. For a particular application these file names will be different depending on the administrative organization and mnemonics chosen to represent each budget file. Normally these file names will be similar from one year to another so that little adjustment is needed after the initial setup.

Standard Variable Expense Summary (Figures 5 and 6)

This template forms a summary of the items listed in the Variable Expense Budget section of the Standard Worksheet. Up to six Standard Worksheets can be combined into one summary worksheet. This is done by reading the names

of materials (column A) and the totals (column N) from the individual worksheets. The order and material names must be identical in all the individual worksheets or wrong totals will be shown in this summary worksheet. As many as six individual worksheets can be included in this summary.

Experiment General Expense Summary (Figures 7 and 9)

This template forms a summary of the items listed in the General Expenses section of the Experiment Worksheet. The names of the material items plus their total cost are copied from the individual worksheets to this summary worksheet. As with the previous worksheet, the names and line numbers of each item must be identical in all worksheets.

Personnel and Capital Summary (Figures 10 and 11)

This summary includes the details of personnel and capital expenses from several individual worksheets. Because the names of contract personnel normally vary from one program to another it is necessary to list each program separately. Similarly, the Capital Expenses Budget items are often different in each program and these have been listed separately. Totals are calculated for each item. Because only totals are calculated for the budget items, it is not necessary that the individual worksheets have the same names or line items in capital expenses. Up to six individual worksheets can be combined.

Budget Summary (Figures 12 and 13)

The Budget Summary is the template more frequently used. This simply copies the data calculated in the Summary Budgets outlined by asterisks on the individual worksheets. Because the text and sums are copied from different worksheets it is important to make certain that the summary budgets have identical formats in each worksheet. Up to six individual worksheets can be combined in a single Budget Summary. It is also possible to combine up to six Budget Summaries using this same template. The outlined Summary Budget can be combined with any other worksheet which has this same block of data outlined with asterisks.

SAMPLE WORKSHEETS

Following are sample printouts of all the modified worksheets. The same worksheet printouts are much larger than the samples shown. Blank rows have been removed to reduce the total length of the worksheet. Actual printouts are longer and may contain a large number of blank rows.

Standard Budget Worksheet

INSTRUCTIONS

Enter the Permanent staff names, salaries and percent of time allocated to the laboratory in the Permanent Personnel Budget. Also enter amounts for the other capital expense items.

Enter the estimated monthly expenditures for each item in the Variables budget section, rows 49-103.

Calculate the totals with !!.

To change the budget, just change the yearly salaries, % time, or individual item or monthly expenses and recalculate with !!.

NOTE: Calculations must be done two times or the summary budget will not be correct.

```

*****
* SUMMARY BUDGET *
*-----*
* Program name   Admin. *
* * * * *
* * * * *
* Total man/years   5.5 *
* * * * *
* Perm. Personnel   81630 *
* Capital Expenses  47355 *
* Total            128985 *
* * * * *
* Total Variable   2083660 *
* * * * *
* * * * *
* Total Budget     2212645 *
*****
    
```

Permanent Personnel Budget

Capital Expenses Budget

Staff	salary/y	% time	Cost
Dr. J. Smith	30000	50	15000
Mr. B. Bandy	22000	100	22000
Miss P. Mukerjee	15550	100	15550
Mrs. J. Main	12330	100	12330
Mrs. T. Noor	11450	100	11450
Mr. P. Misra	5300	100	5300
			0
			0
			0
			0
			0

Adding Machine	700
word processor	13200
office chairs	567
desk	233
book cases	1230
file cabinets	493
radio set	9450
Pluviometer	137
Tractor	17350
Disc-harrow	3995

TOTAL PERMANENT PERSONNEL 81630

TOTAL CAPITAL EXPENSES 47355

Standard Variable Expenses Budget

Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	TOTAL
120 Daily Labor	100000	100000	100000	100000	100000	100000	100000	100000	100000	100000	100000	100000	1200000
211 Telephone	200	200	200	200	200	200	200	200	200	200	200	200	2400
212 Electricity	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	36000
213 Printing	4500	1500	1500	1000	3000	3000	3500	3500	500	3000	2000	3000	30000
214 Publicity	2000		1000	1200			3000			4550	2000	1000	14750
221 Travel	2100	1500	2000	2000	4000	1000	2300		2000		3000		19900
222 Per Diem	7000	8000	4500	9000	8000	5600	4650	8900	7000	6200	3220	4000	76070
223 Freight	400	400	400	400	400	400	400	400	400	400	400	400	4800
224 Storage	8000												8000
225 Veh insuran	25000						2500						27500
226 Other insur	30000						30000						60000
231 Land rental	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	24000
232 Equip. rental			3500	5000	2000			3000	6000	3000	2100		24600
233 Other rents	500						500					500	1500
241 Bldg. Repai	2500	2600	3200	5000	2000	8000	1200	1230	4200	4500	1000	1000	36430
251 Medical	5000	6000	4000	4200	3000	1000	2100	2000	1000	500	2000	2300	33100
253 Bank charge	45	45	45	45	45	45	45	45	45	45	45	45	540
311 Paper	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	24000
321 Cleaning	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	30000
323 Food	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	22800
325 Gas/oil	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	156000
327 Construction						25000		25000					50000
328 Raw materials						170000							170000
329 Office fund	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	21600
330 Office mach	300	300	300	300	300	300	300	300	300	300	300	300	3600
349 Misc.	200		100	4000		230	190	300	500		230	320	6070
													0
Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	TOTAL
TOTAL VARIABLE	213945	146745	146945	158545	149145	340975	177085	171075	148345	148895	142695	139265	2083660

RATIOS

Perm. Personnel/Total	.04
Capital Expenses/Total	.02
Variable/Total	.94

STANDARD BUDGET WORKSHEET

Figure 1

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Standard Budget Worksheet													
INSTRUCTIONS													
Enter the Permanent staff names, salaries and percent of time allocated to the laboratory in the Permanent Personnel Budget. Also enter amounts for the other capital expense items. Enter the estimated monthly expenditures for each item in the Variables budget section, rows 49-103. Calculate the totals with !!. To change the budget, just change the yearly salaries, % time, or individual item or monthly expenses and recalculate with !!. NOTE: Calculations must be done two times or the summary budget will not be correct.													

* SUMMARY BUDGET *													

* Program name Admin- *													

* Total man/years SUM(D26:D32)/100 *													

* Perm. Personnel E41 *													
* Capital Expenses K41 *													
* Total SUM(M11:M12) *													

* Total Variable N106 *													

* Total Budget M13+M15 *													

Permanent Personnel Budget							Capital Expenses Budget						
Staff	salary/y	% time	Cost										
Dr. J. Smith	30000	50	C26*(D26/100)	Adding Machine	700								
Mr. H. Bandy	22000	100	C27*(D27/100)	word processor	13200								
Miss P. Mukergee	15550	100	C28*(D28/100)	office chairs	587								
Mrs. J. Nain	12330	100	C29*(D29/100)	desk	233								
Mrs. T. Noor	11450	100	C30*(D30/100)	book cases	1230								
Mr. P. Misra	5300	100	C31*(D31/100)	file cabinets	493								
			C32*(D32/100)	radio set	9450								
			C33*(D33/100)	Pluviometer	137								
			C34*(D34/100)	Tractor	17350								
			C35*(D35/100)	Disc-barrow	3995								
			C39*(D39/100)										
TOTAL PERMANENT PERSONNEL				SUM(E26:E39)	TOTAL CAPITAL EXPENSES				SUM(K26:K39)				
Standard Variable Expenses Budget													
Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
120 Daily Labor	100000	100000	100000	100000	100000	100000	100000	100000	100000	100000	100000	100000	SUM(B48:M48)
211 Telephone	200	200	200	200	200	200	200	200	200	200	200	200	SUM(B49:M49)
212 Electricity	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	SUM(B50:M50)
213 Printing	4500	1500	1500	1000	3000	3000	3500	3500	500	3000	2000	3000	SUM(B51:M51)
214 Publicity	2000		1000	1200			3000			4550	2000	1000	SUM(B52:M52)
221 Travel	2100	1500	2000	2000	4000	1000	2300		2000		3000		SUM(B53:M53)
222 Per Dies	7000	8000	4500	9000	8000	5600	4850	8900	7000	6200	3220	4000	SUM(B54:M54)
223 Freight	400	400	400	400	400	400	400	400	400	400	400	400	SUM(B55:M55)
224 Storage	8000												SUM(B56:M56)
225 Neh insuran	25000						2500						SUM(B57:M57)
226 Other insur	30000						30000						SUM(B58:M58)
231 Land rental	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	SUM(B59:M59)
232 Equip. rental			3500	5000	2000			3000	6000	3000	2100		SUM(B60:M60)
233 Other rents	500						500				500		SUM(B61:M61)
241 Bldg. Repai	2500	2800	3200	5000	2000	8000	1200	1230	4200	4500	1000	1000	SUM(B62:M62)
251 Medical	5000	6000	4000	4200	3000	1000	2100	2000	1000	500	2000	2300	SUM(B63:M63)
253 Bank charge	45	45	45	45	45	45	45	45	45	45	45	45	SUM(B64:M64)
311 Paper	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	SUM(B65:M65)
321 Cleaning	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	SUM(B66:M66)
323 Food	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	SUM(B67:M67)
325 Gas/oil	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	SUM(B68:M68)
327 Construction						25000		25000					SUM(B69:M69)
328 Raw materials						170000							SUM(B70:M70)
329 Office fund	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	SUM(B71:M71)
330 Office mach	300	300	300	300	300	300	300	300	300	300	300	300	SUM(B72:M72)
349 Misc.	200		100	4000		230	190	300	500		230	320	SUM(B73:M73)
													SUM(B74:M74)
Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	TOTAL
TOTAL VARIABLE	SUM(B47:B102)												SUM(B106:M106)
RATIOS													
Perm. Personnel/Total	E41/(E41+K41+N106)												
Capital Expenses/Total	K41/(E41+K41+N106)												
Variable/Total	N106/(E41+K41+N106)												

STANDARD BUDGET WORKSHEET WITH FORMULAE

Figure 2

Experiment Budget Worksheet

INSTRUCTIONS

For a particular experimental program enter the names for each type of experiment to be conducted in rows 40-42, columns C-M plus the area occupied by each experiment and the number of locations.

Enter the permanent staff names, salaries and percent of time allocated to the experimental program in the Permanent Personnel Budget. Also enter amounts for the Capital Expenses Budget.

Enter the names, quantities and prices of materials needed for each single experiment in the Materials Budget in rows 49-82.

Enter estimates of the cost per hectare of general budget items in the General Budget in rows 88-103.

Calculate the totals with !!

To change the budget, just change numbers of locations or prices of materials and recalculate with !!

NOTE: Calculations must be done two times or the summary budget will not be correct.

***** * SUMMARY BUDGET *****	
* Program name	TORALAPA
* Hectares	9.64
* Locations	29
* Total man/years	4.25
* Permanent Pers.	74000
* Capital Expenses	38835
* Total	112835
* Total Variable	9009
* Total Budget	121844

Permanent Personnel Budget

Capital Expenses Budget

Staff	salary/yr	% time	Cost
Dr. P.K. Nia	25000	50	12500
Dr. P.P. Sharma	23000	100	23000
Mr. A.J. Wong	18000	100	18000
Jagdish Meena	12000	75	9000
Horacio Fuentes	11500	100	11500
			0

Building Maint.	3000
Equipment Repairs	3500
New Equipment	30000
Office Supplies	1550
Insurance	
Misc.	785

TOTAL PERMANENT PERSONNEL

74000

TOTAL CAPITAL EXPENSES

38835

Experiment Variable Expenses Budget

EXPERIMENT NAMES

	Weed Control Trial	Insect Control Trial	Plantin Control Trial	Variety Trial	Variety X Density	Plantin Date Trial	Disease Control Trial	9.64 29
	Port. Rates Trial	Port. Rates Trial	Port. Rates Trial	Port. Rates Trial	Port. Rates Trial	Port. Rates Trial		
Area in hectares	.22	.22	.34	.43	.45	.52	.22	
Locations	4	5	4	6	4	2	4	

Experiment Materials Expenses Budget

TOTAL Kg

TOTAL

Item	Kg	1.8	1.8	2.7	3.2	4.2	2.7	2.7				
Seed	5/Kg	36	45	54	96	84	27	54	0	0	0	79.2
Fertilizer	Kg	6	12	8	16	8			0	0	0	396
	11/Kg	264	660	352	1056	352	0	0	0	0	0	244
Furadan	Kg		.5	.3					0	0	0	2684
	87/Kg	0	218	104	0	0	0	0	0	0	0	3.7
Aldrin	Kg		.3	.2				.2	0	0	0	322
	33/Kg	0	50	26	0	0	0	26	0	0	0	102
Bayleton	Kg		.3					.4	0	0	0	3.1
	130/Kg	0	195	0	0	0	0	208	0	0	0	403
2,4-D	Kg	.1	.1	.1	.1	.2	.1		0	0	0	2.2
	112/Kg	45	0	45	67	0	45	45	0	0	0	246
Surfactant	Kg	.01	.01	.01	.01	.02	.01	.02	0	0	0	.37
	97/Kg	4	5	4	6	8	2	8	0	0	0	36
	Kg								0	0	0	0
	/Kg	0	0	0	0	0	0	0	0	0	0	0
TOTAL MATERIALS		349	1172	565	1225	444	74	341	0	0	0	4189

Experiment General Expenses Budget

Item	cost/ha	cost / experiment											
Gas-oil	80	70	88	109	206	144	83	70	0	0	0	0	771
Per Diem	40	35	44	54	103	72	42	35	0	0	0	0	386
Labor	98	86	108	133	253	176	102	86	0	0	0	0	945
Paper	25	22	28	34	65	45	26	22	0	0	0	0	241
Storage	56	49	62	76	144	101	58	49	0	0	0	0	540
Bus tks.	30	26	33	41	77	54	31	26	0	0	0	0	289
Misc.	70	62	77	95	181	126	73	62	0	0	0	0	675
Freight	2	2	2	3	5	4	2	2	0	0	0	0	19
Land rent	99	87	109	135	255	178	103	87	0	0	0	0	954
	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL GENERAL		440	550	680	1290	900	520	440	0	0	0	0	4820
TOTAL VARIABLE		789	1722	1265	2515	1344	594	781	0	0	0	0	9009

RATIOS

Perm. Personnel/Total	.61
Capital Expenses/Total	.32
Variable/Total	.07

EXPERIMENT BUDGET WORKSHEET

Figure 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Experiment Budget Worksheet												
2													
3	INSTRUCTIONS												
4													
5	For a particular experimental program enter the names for each type												
6	experiment to be conducted in rows 40-42, columns C-M plus the area												
7	occupied by each experiment and the number of locations.												
8	Enter the permanent staff names, salaries and percent of time alloca												
9	to the experimental program in the Permanent Personnel Budget. Also ente												
10	amounts for the Capital Expenses Budget.												
11	Enter the names, quantities and prices of materials needed for each												
12	single experiment in the Materials Budget in rows 49-82.												
13	Enter estimates of the cost per hectare of general budget items in t												
14	General Budget in rows 88-103.												
15	Calculate the totals with !!												
16	To change the budget, just change numbers of locations or prices of												
17	materials and recalculate with !!												
18	NOTE: Calculations must be done two times or the summary budget												
19	will not be correct.												
20													
21													
22													
23	Permanent Personnel Budget						Capital Expenses Budget						
24	-----												
25	Staff	salary/y	% time	Cost									
26	Dr. P.K. Nim	25000	50	C26*(D26/100)	Building Maint.	3000							
27	Dr. P.P. Sharma	23000	100	C27*(D27/100)	Equipment Repairs	3500							
28	Mr. A.J. Wong	18000	100	C28*(D28/100)	New Equipment	30000							
29	Jagdish Menaa	12000	75	C29*(D29/100)	Office Supplies	1550							
30													
31				C35*(D35/100)									
32													
33	TOTAL PERMANENT PERSONNEL	SUM(E26:E35)			TOTAL CAPITAL EXPENSES	SUM(K26:K35)							
34	-----												
35	Experiment Variable Expenses Budget				EXPERIMENT NAMES								
36		Weed	Insect	Fert.	Variet	Variet	Plantl	Disease					
37		Control	Control	Rates	Trial	X	Date	Control					
38		Trial	Trial	Trial		Densit	Trial	Trial					
39	-----												
40	Area in hectares	.22	.22	.34	.43	.45	.52	.22					SUM(C44*C45, D44*D45, ... L44*L45)
41	Locations	4	5	4	6	4	2	4					SUM(C45:M45)
42	-----												
43													
44	Item												TOTAL Kg TOTAL
45	Seed	Kg 1.8	1.8	2.7	3.2	4.2	2.7	2.7					SUM(C45*C49, D45*D49, ... L45*L49)
46	5	/Kg A50*C45*C49											SUM(C50:M50)
47	Fertilizer	Kg 6	12	8	16	8							SUM(C45*C51, D45*D51, ... L45*L51)
48	11	/Kg A52*C45*C51											SUM(C52:M52)
49	Furadan	Kg	.5	.3									SUM(C45*C53, D45*D53, ... L45*L53)
50	87	/Kg A54*C45*C53											SUM(C54:M54)
51	Aldrin	Kg	.3	.2				.2					SUM(C45*C55, D45*D55, ... L45*L55)
52	33	/Kg A56*C45*C55											SUM(C56:M56)
53	Bayleton	Kg	.3					.4					SUM(C45*C57, D45*D57, ... L45*L57)
54	130	/Kg A58*C45*C57											SUM(C58:M58)
55	2,4-D	Kg	.1	.1		.2	.1						SUM(C45*C59, D45*D59, ... L45*L59)
56	112	/Kg A60*C45*C59											SUM(C60:M60)
57													
58		Kg											SUM(C45*C61, D45*D61, ... L45*L61)
59		/Kg A82*C45*C61											SUM(C62:M62)
60	-----												
61	TOTAL MATERIALS	SUM(C50, C52, C54, C56, C58, C60, C62, C64, C66, C68, C70)											
62	-----												
63	Experiment General Expenses Budget												
64	Item	cost/ha	cost / experiment										
65	Gas-oil	80	B88*C44*C45										
66	Per Diem	40	B89*C44*C45										
67	Labor	98	B90*C44*C45										
68	Paper	25	B91*C44*C45										
69	Storage	56	B92*C44*C45										
70	Bus tks.	30	B93*C44*C45										
71													SUM(C88:M88)
72													SUM(C89:M89)
73													SUM(C90:M90)
74													SUM(C91:M91)
75													SUM(C92:M92)
76													SUM(C93:M93)
77													
78		0	B103*C44*C45										
79													SUM(C103:M103)
80	TOTAL GENERAL	SUM(C88:C103)											
81	TOTAL VARIABLE	C84+C10											
82	-----												
83	RATIOS												
84	Perm. Personnel/Total	E37/(E37+K37+N106)											
85	Capital Expenses/Total	K37/(E37+K37+N106)											
86	Variable/Total	M106/(E37+K37+N106)											

EXPERIMENT BUDGET WORKSHEET WITH FORMULAE

Figure 4

STANDARD VARIABLE EXPENSE SUMMARY BUDGET

	Q1	Q2	Q3	Q4	Year	%
100 Raw Materials	10000	10000	10000	10000	40000	100%
110 Labor	10000	10000	10000	10000	40000	100%
120 Manufacturing Overhead	10000	10000	10000	10000	40000	100%
130 Selling Expense	10000	10000	10000	10000	40000	100%
140 Administrative Expense	10000	10000	10000	10000	40000	100%
150 Interest Expense	10000	10000	10000	10000	40000	100%
160 Income Tax Expense	10000	10000	10000	10000	40000	100%
170 Depreciation Expense	10000	10000	10000	10000	40000	100%
180 Amortization Expense	10000	10000	10000	10000	40000	100%
190 Other Expense	10000	10000	10000	10000	40000	100%
200 Total Expense	100000	100000	100000	100000	400000	100%

Standard
Worksheets

The three smaller tables are arranged horizontally below the main table. Each table contains a header section and a data grid. The tables represent individual expense categories or departments that are combined into the summary budget above.

COMBINING STANDARD VARIABLE EXPENSE BUDGETS

Figure 6

EXPERIMENT MATERIALS EXPENSES SUMMARY

		PROGRAM NAME						TOTAL Kg	TOTAL COST
		San Benito	Toralapa	Santa Cruz	Chipiriri	La Jota	Tarrquite		
Seed	Kg	59.6	79.2	89.6	62.2	35.6	46.3	372.5	
	5/Kg	298	396	448	311	178	232		1863
Fertilizer	Kg	0	244	325	195	98	210	1072	
	11/Kg	0	2684	3575	2145	1078	2310		11792
Furadan	Kg	6.5	3.7	12.3	2.4	2.6	0	27.5	
	87/Kg	568	322	1070	209	226	0		2393
Aldrin	Kg	3.5	3.1	2.3	2.1	4.5	2.5	18	
	33/Kg	116	102	76	69	149	83		594
Bayleton	Kg	6.5	3.1	0	1.6	1.2	3.1	15.5	
	130/Kg	845	403	0	208	156	403		2015
2,4-D	Kg	0	2.2	3.4	1.9	0	6.5	14	
	112/Kg	0	246	381	213	0	728		1568
Surfactant	Kg	.58	.37	.18	.45	0	1.5	3.08	
	97/Kg	56	36	16	44	0	146		297
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
	Kg	0	0	0	0	0	0	0	0
	/Kg	0	0	0	0	0	0	0	0
TOTAL MATERIALS		1880	4189	5565	3199	1787	3901	1522.56	20521

EXPERIMENT GENERAL EXPENSES SUMMARY

		PROGRAM NAME						TOTALS
		San Benito	Toralapa	Santa Cruz	Chipiriri	La Jota	Tarrquite	
TOTAL HECTARES		4.59	9.64	10.25	8.54	4.15	6.95	44.12
Item	cost/ha							
Gas-oil	80	367	771	820	683	332	556	3530
Per Dies	40	184	386	410	342	166	278	1765
Labor	98	450	945	1005	837	407	681	4324
Paper	25	115	241	256	214	104	174	1103
Storage	58	257	540	574	478	232	389	2471
Bus tks.	30	138	289	308	256	125	209	1324
Misc.	70	321	675	718	598	291	487	3088
Freight	2	9	19	21	17	8	14	88
Land rent	99	454	954	1015	845	411	688	4368
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0
TOTAL GENERAL		2295	4820	5125	4270	2075	3475	22060

EXPERIMENT MATERIALS EXPENSES SUMMARY AND EXPERIMENT GENERAL EXPENSES SUMMARY

Figure 7

Experiment
Worksheets

Category	Item	Amount
Salaries
Benefits
Travel
Supplies
Equipment
Printing
Postage
Telephone
Electricity
Water
Gas
Insurance
Depreciation
Interest
Other
TOTAL		...

Category	Item	Amount
Salaries
Benefits
Travel
Supplies
Equipment
Printing
Postage
Telephone
Electricity
Water
Gas
Insurance
Depreciation
Interest
Other
TOTAL		...

Category	Item	Amount
Salaries
Benefits
Travel
Supplies
Equipment
Printing
Postage
Telephone
Electricity
Water
Gas
Insurance
Depreciation
Interest
Other
TOTAL		...

EXPERIMENT GENERAL EXPENSE SUMMARY

EXPENSE ACCOUNT	PROGRAM 800		PROGRAM 801		PROGRAM 802		PROGRAM 803		PROGRAM 804		TOTAL
	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	
Salaries
Benefits
Travel
Supplies
Equipment
Printing
Postage
Telephone
Electricity
Water
Gas
Insurance
Depreciation
Interest
Other
TOTAL GENERAL

COMBINING EXPERIMENT GENERAL EXPENSE BUDGETS

Figure 9

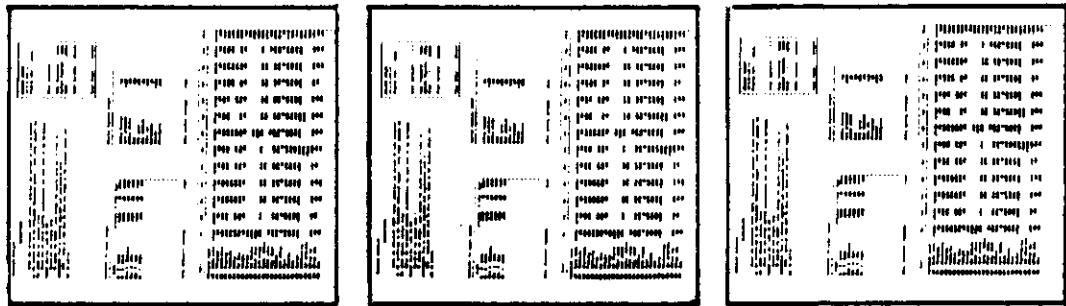
PERMANENT PERSONNEL AND CAPITAL EXPENSES SUMMARY

PROGRAM NAME					
Permanent Personnel Budget				Capital Expenses Budget	
Staff	salary/yr	% time	Cost		
San Benito					
Dr. P.K. Nim	30000	50	15000	Tractor	45000
Dr. R. Zemach	24000	100	24000	Equipment Repairs	3500
Mr. K. Green	17500	100	17500	New Equipment	85000
Jagdish Mensa	12000	25	3000	Coffee Mugs	120
			0	Coffee Table	320
			0	Misc.	785
			0		
Toralapa					
Dr. P.K. Nim	25000	50	12500	Building Maint.	3000
Dr. P.P. Sharma	23000	100	23000	Equipment Repairs	3500
Mr. A.J. Wong	18000	100	18000	New Equipment	30000
Jagdish Mensa	12000	75	9000	Office supplies	1550
Horacio Fuentes	11500	100	11500	Insurance	
			0	Misc.	785
			0		
			0		
Santa Cruz					
Dr. C. Hill	32000	100	32000	Building Maint.	3000
Dr. T. Valteau	19850	100	19850	Equipment Repairs	3500
Mrs. J. Tesema	28000	50	13000	New Equipment	35100
Mrs. S. Thon	7580	100	7580	Pink noise makers	1650
Mr. C. Carroll	14200	50	7100	Electric pencil sharpener	50
			0	Misc.	2580
			0		
			0		
Chipiriri					
Dr. S. Adams	25400	50	12700	Building Maint.	3000
Dr. B. Perron	23000	100	23000	Equipment Repairs	3500
Mr. C. Davis	15600	100	15600	New Equipment	45800
Mr. J. Jakus	12000	75	9000	Sony Walkman	560
			0	Ronco Weed Eater	29
			0	Misc.	785
			0		
La Jota					
Dr. S. Adams	25000	50	12500	Building Maint.	3000
Dr. K. Iezzone	34000	50	17000	Porta Jon	2600
Mr. H. Hurni	17500	100	17500	New Equipment	15600
Mrs. T. Chial	18000	75	12000	Office Supplies	1550
Mr. E. Chaike	9000	100	9000	Lights	5600
			0	Misc.	785
			0		
			0		
Tarrqute					
Dr. K. Iezzone	34000	50	17000	ditch digger	32000
Mr. J. Wang	26300	100	26300	Equipment Repairs	3500
Mr. C. Dale	18500	100	18500	New Equipment	30000
Mr R. M. Smith	13500	75	10125	Office Supplies	1550
			0	shortwave radio	4560
			0	Misc.	2600
			0		
TOTALS					
	542210		413035		356239
PERMANENT PERSONNEL AND CAPITAL EXPENSES COMBINED					769274

PERMANENT PERSONNEL AND CAPITAL EXPENSES SUMMARY

Figure 10

Standard or Experiment
Worksheets



PERSONNEL & CAPITAL EXPENSE SUMMARY

COMBINING PERSONNEL AND CAPITAL BUDGETS

Figure 11

BUDGET SUMMARY

	PROGRAM NAME						SUMMARY BUDGET	
	San Benito	Toralapa	Santa Cruz	Chipiriri	La Jota	Tarrqute	Program name	CENTRAL
Hectares	4.59	9.64	10.25	8.54	4.15	6.95	Hectares	44.12
Locations	16	29	31	24	14	22	Locations	136
Total man/years	2.75	4.25	4	3.25	3.75	3.25	Total man/yea	21.25
Permanent Pers.	59500	74000	79310	60300	68000	71925	Permanent Per	413035
Capital Expenses	114725	38835	45860	53474	29135	74210	Capital Expen	356239
Total	174225	112835	125170	113774	97135	146135	Total	769274
Total Variable	4175	9009	10690	7469	3862	7376	Total Variabl	42581
								0
								0
Total Budget	178400	121844	135860	121243	100997	153511	Total Budget	811855
RATIOS								
Perm. Personnel/Total	.33	.61	.58	.50	.67	.47		.51
Capital Expen./Total	.64	.32	.34	.44	.29	.48		.44
Variable / Total	.02	.07	.08	.06	.04	.05		.05

BUDGET SUMMARY

	PROGRAM NAME					SUMMARY BUDGET	
	Admin.	Library	Soils Lab	Stats Lab	Shop	Program name	Central
Total man/years	5.5	3.5	3.5	2.75	1.5	Total man/yes	16.75
Perm. Personnel	61630	41350	57050	44600	22140	Perm. Personn	246770
Capital Expenses	47355	52817	43901	25849	68851	Capital Expen	238773
Total	128985	94167	100951	70449	90991	Total	485543
Total Variable	2083660	283275	380430	307570	298420	Total Variabl	3353355
							0
							0
Total Budget	2212645	377442	481381	378019	389411	Total Budget	1838898
RATIOS							
Perm. Personnel/Total	.04	.11	.12	.12	.06		.06
Capital Expen./Total	.02	.14	.09	.07	.18		.06
Variable / Total	.94	.75	.79	.81	.77		.87

TWO EXAMPLES OF A BUDGET SUMMARY

Figure 12

Standard or experiment
Worksheet

Standard or experiment Worksheet

Standard or experiment Worksheet

Standard or experiment Worksheet

GENERAL SUMMARY BUDGET

BUDGET SUMMARY		PROGRAM NAME				SUMMARY BUDGET	
	CAPITAL	DURABLE	PERMANENT	UTILITIES	PERMANENT	PERMANENT	STD/1964
Total man/years	18.76	20.9	14.25	24.15	0	0	07.65
Per. Personnel	248770	200400	202400	280000	132000	132000	131000
Capital Expenses	228175	53700	340800	83000	298100	298100	203700
Total Variable	248770	286100	198200	248100	145800	145800	131300
Total Budget	248770	53700	234000	308100	132000	132000	132000
RATIO							
Per. Personnel/Total	.64	.08	.08	.13	.08	.08	.08
Capital Expen./Total	.21	.07	.08	.08	.08	.08	.08
Variable / Total							

COMBINING BUDGET SUMMARIES FOR A MAIZE RESEARCH PROGRAM

Figure 13

TEMPLATE LISTINGS

This section contains a listing of every keystroke required to generate the templates. To economize on space the listings are shown in two columns. When copying these listings first enter column one then column two on each page.

If you are using SuperCalc, you can take advantage of the eXecute function to automatically form the template from this file. Using a word processor copy the following listings to disk files. Then with SuperCalc perform a /X(ecute) and enter a file name. The template will be formed from the file of commands. A more complete description of the use of the command file can be found in the SuperCalc manual.

SuperCalc Commands

SuperCalc commands are entered with / and the first letter of the command. Each command is followed by prompts that list the possible one-letter entries available for that command. Below are explanations for the commands used in the following spreadsheets.

- Z Z(ap): Clears the entire worksheet
- G G(lobal): Commands that effect the entire worksheet
- M M(anual): Recalculate the worksheet only if the user presses the ! key
- F F(ormat): To specify formatting for entire worksheet, rows, columns or individual cells
- P P(rotect): a cell, partial column, partial row, or block so that contents and formatting cannot be changed
- U U(nprotect): a protected cell, partial column, partial row, or block
- R R(ow): A specific column of the spreadsheet
- C C(olumn): A specific column of the spreadsheet
- G G(eneral): Display the number as a real number
- \$ Display the number rounded to the nearest cent
- I I(nterger): Display the number as an integer
- E E(ntry): A specific cell of the spreadsheet
- T T(ext): Text display
- R R(ight): Justify text or numbers right
- L L(eft): Justify text or numbers left
- ! The "!" Key forces recalculation of entire spreadsheet. You must recalculate twice in order for the summary blocks to be correct

- = The "=" moves the cursor to the cell that follows it
- " All text entered is preceded by a quotation mark
- ' Text entered after ' will repeat itself (All text will overlap cells following if the cells are blank)
- < Move cursor one cell to the left
- > Move cursor one cell to the right
- v Move cursor one cell down
- ^ Move cursor one cell up

The following are examples of commands used in the following spreadsheets.

- / Z Y Z(ap) (clear) entire worksheet? Y(es)
- / G M G(lobal) M(anual) recalculation is done only if user presses the ! key, instead of being automatically recalculated
- / F G 9 F(ormat) G(lobal)ly all columns 9 characters wide
- / F G I F(ormat) G(lobal)ly all numbers in I(nteger) form
- / F R 1,G F(ormat) R(ow) 1 in G(eneral) form
- / F E A1,\$ F(ormat) E(ntry) cell A1 to the nearest cent
- / F C A,14 F(ormat) C(olumn) A 14 characters wide
- / F R 1,T R F(ormat) R(ow) 1 all T(ext) justified to the R(ight)
- / F R 1,T L F(ormat) R(ow) 1 all T(ext) justified to the L(eft)
- / P A1:N25 P(rotect) cell A1 through N25
- / U A1:N25 U(nprotect) cell A1 through N25
- = A1 Move the cursor to cell A1
- ! ! Recalculate the entire spreadsheet twice

"Jan. Enter the text "Jan." into the current cell

'- Repeat the text "-" (-----)

NOTE: After text or a number is entered into a cell the cursor moves one cell in the direction it last went. If the last movement was down then the cursor will continue down after return is pressed.

STANDARD BUDGET WORKSHEET

/ Z Y
/ F G 8
/ F C A, 16
/ G M

= A1
"STANDARD BUDGET WORKSHEET
= B3
"INSTRUCTIONS

v = A5
" Enter the Permanent staff names, salaries and percent of time allocated
"to the laboratory in the Permanent Personnel Budget. Also enter amounts for
"the other capital expense items.
" Enter the estimated monthly expenditures for each item in the Variables
"budget section, rows 49-103.
" Calculate the totals with !!.
" To change the budget, just change the yearly salaries, % time, or
"individual item or monthly expenses and recalculate with !!.
" NOTE: Calculations must be done two times or the summary budget will
"not be correct.

v = J2
" **
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" **

= K2
"*****

v = K3
"SUMMARY BUDGET
"-----

"Program name
v v v "Total man/years
> = M9
SUM(D26:D32)/100
= K11
"Perm. Personnel
> E41
= K12

STANDARD BUDGET WORKSHEET

"Capital Expenses	C33*(D33/100)
> K41	C34*(D34/100)
= K13	C35*(D35/100)
"Total	C36*(D36/100)
> SUM(M11:M12)	C37*(D37/100)
= K15	C38*(D38/100)
"Total Variable	C39*(D39/100)
> N106	= A40
= K19	'-
"Total Budget	= A41
> M13+M15	"TOTAL PERMANENT PERSONNEL
= K20	= E41
*****	SUM(E26:E39)
v = N2	= H41
"**	"TOTAL CAPITAL EXPENSES
" *	= K41
" *	SUM(K26:K39)
" *	= A44
" *	'-
" *	> = A45
" *	" Month
" *	"Jan.
" *	"Feb.
" *	"Mar.
" *	"Apr.
" *	"May.
" *	"Jun.
" *	"Jul.
" *	"Aug.
" *	"Sep.
" *	"Oct.
" *	"Nov.
"**	"Dec.
	"TOTAL
	= A46
	'-
> = A23	= A47
"Permanent Personnel Budget	"VARIABLES BUDGET
= H23	v = N48
"Capital Expenses Budget	SUM(B48:M48)
= A24	SUM(B49:M49)
'-	SUM(B50:M50)
= A25	SUM(B51:M51)
" Staff	SUM(B52:M52)
> "salary/yr	SUM(B53:M53)
" % time	SUM(B54:M54)
" Cost	SUM(B55:M55)
v = E26	SUM(B56:M56)
C26*(D26/100)	SUM(B57:M57)
C27*(D27/100)	SUM(B58:M58)
C28*(D28/100)	SUM(B59:M59)
C29*(D29/100)	SUM(B60:M60)
C30*(D30/100)	SUM(B61:M61)
C31*(D31/100)	SUM(B62:M62)
C32*(D32/100)	SUM(B63:M63)

STANDARD BUDGET WORKSHEET

SUM(B64:M64)	"TOTAL
SUM(B65:M65)	= A105
SUM(B66:M66)	' -
SUM(B67:M67)	= A106
SUM(B68:M68)	"TOTAL VARIABLE
SUM(B69:M69)	SUM(B47:B102)
SUM(B70:M70)	SUM(C47:C102)
SUM(B71:M71)	SUM(D47:D102)
SUM(B72:M72)	SUM(E47:E102)
SUM(B73:M73)	SUM(F47:F102)
SUM(B74:M74)	SUM(G47:G102)
SUM(B75:M75)	SUM(H47:H102)
SUM(B76:M76)	SUM(I47:I102)
SUM(B77:M77)	SUM(J47:J102)
SUM(B78:M78)	SUM(K47:K102)
SUM(B79:M79)	SUM(L47:L102)
SUM(B80:M80)	SUM(M47:M102)
SUM(B81:M81)	SUM(B106:M106)
SUM(B82:M82)	= A107
SUM(B83:M83)	' -
SUM(B84:M84)	= A109
SUM(B85:M85)	"RATIOS
SUM(B86:M86)	= A110
SUM(B87:M87)	" Perm. Personnel/Total
SUM(B88:M88)	> E41/(E41+K41+N106)
SUM(B89:M89)	= A111
SUM(B90:M90)	" Capital Expenses/Total
SUM(B91:M91)	> K41/(E41+K41+N106)
SUM(B92:M92)	= A112
SUM(B93:M93)	" Variable/Total
SUM(B94:M94)	> N106/(E41+K41+N106)
SUM(B95:M95)	
SUM(B96:M96)	/ P A1:N112
SUM(B97:M97)	/ U A26:D32
SUM(B98:M98)	/ U H26:K32
SUM(B99:M99)	/ U A49:M82
SUM(B100:M100)	/ U A89:M102
SUM(B101:M101)	
SUM(B102:M102)	
= A103	/ F G I
' -	/ F E C110,\$
> = A104	/ F E C111,\$
" Month	/ F E C112,\$
" Jan.	/ F E M9,G
" Feb.	/ F R 45,T R
" Mar.	/ F E A45,T L
" Apr.	/ F R 86,T R
" May.	/ F E A86,T L
" Jun.	/ F E A25,T L
" Jul.	/ F E C25,T L
" Aug.	/ F R 104,T R
" Sep.	/ F E A104,T L
" Oct.	/ F E E25,T R
" Nov.	! !
" Dec.	= A1

EXPERIMENT BUDGET WORKSHEET

/ Z Y
/ F G 9
/ F C A,14
/ F C B,3
/ G M
v = a1

"EXPERIMENT BUDGET WORKSHEET

v > "INSTRUCTIONS

< < vv " For a particular experimental program enter the names for each type of experiment to be conducted in rows 40-42, columns C-M plus the area occupied by each experiment and the number of locations.

" Enter the permanent staff names, salaries and percent of time allocated to the experimental program in the Permanent Personnel Budget. Also enter amounts for the the Capital Expenses Budget.

" Enter the names, quantities and prices of materials needed for each single experiment in the Materials Budget in rows 49-82.

" Enter estimates of the cost per hectare of general budget items in the General Budget in rows 88-103.

" Calculate the totals with !!

" To change the budget, just change numbers of locations or prices of materials and recalculate with !!

" NOTE: Calculations must be done two times or the summary budget will not be correct .

v = J2

" **
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" *
" **

= K2

= K20

v = N2

" *
" *
" *
" *
" *

EXPERIMENT BUDGET WORKSHEET

" *	C33*(D33/100)
" *	C34*(D34/100)
" *	C35*(D35/100)
" *	= A36
" *	' -
" *	= A37
" *	"TOTAL PERMANENT PERSONNEL
" *	= E37
" *	SUM(E26:E35)
" *	= H37
" *	"TOTAL CAPITAL EXPENSES
" *	= K37
"**	SUM(K26:K35)
v = K3	= A39
"SUMMARY BUDGET	"Experiment Variable
"-----	Expenses Budget
"Program name	= H39
v "Hectares	"EXPERIMENT NAMES
"Locations	v = A43
"Total man/years	' -
v "Permanent Pers.	"Area in hectares
"Capital Expenses	= N44
"Total	SUM(C44*C45,D44*D45,E44*E45
v "Total Variable	,F44*F45,G44*G45,H44*H45,I44
vvv "Total Budget	*I45,J44*J45,K44*K45,L44*L45
= M7	,M44*M45)
N44	= A45
N45	"Locations
SUM(D26:D32)/100	= N45
v E37	SUM(C45:M45)
K37	= A46
SUM(M11:M12)	' -
v N106	"Experiment Materials
vvv M13+M15	Expenses Budget
	= M47
	"TOTAL Kg
= A23	= N47
"Permanent Personnel Budget	"TOTAL
= H23	> = A48
"Capital Expenses Budget	" Item
> = A24	= B49
' -	" Kg
= A25	= M49
" Staff	SUM(C45*C49,D45*D49,E45*E49
> "salary/yr	,F45*F49,G45*G49,H45*H49,I45
" % time	*I49,J45*J49,K45*K49,L45*L49)
" Cost	= B50
v = E26	"/Kg
C26*(D26/100)	A50*C45*C49
C27*(D27/100)	A50*D45*D49
C28*(D28/100)	A50*E45*E49
C29*(D29/100)	A50*F45*F49
C30*(D30/100)	A50*G45*G49
C31*(D31/100)	A50*H45*H49
C32*(D32/100)	A50*I45*I49

EXPERIMENT BUDGET WORKSHEET

A50*J45*J49
A50*K45*K49
A50*L45*L49
> SUM(C50:M50)
= B51
" Kg
= M51
SUM(C45*C51,D45*D51,E45*E51
,F45*F51,G45*G51,H45*H51,I45
*I51,J45*J51,K45*K51,L45*L51)
= B52
"/Kg
A52*C45*C51
A52*D45*D51
A52*E45*E51
A52*F45*F51
A52*G45*G51
A52*H45*H51
A52*I45*I51
A52*J45*J51
A52*K45*K51
A52*L45*L51
> SUM(C52:M52)
= B53
" Kg
= M53
SUM(C45*C53,D45*D53,E45*E53
,F45*F53,G45*G53,H45*H53,I45
*I53,J45*J53,K45*K53,L45*L53)
= B54
"/Kg
A54*C45*C53
A54*D45*D53
A54*E45*E53
A54*F45*F53
A54*G45*G53
A54*H45*H53
A54*I45*I53
A54*J45*J53
A54*K45*K53
A54*L45*L53
> SUM(C54:M54)
= B55
" Kg
= M55
SUM(C45*C55,D45*D55,E45*E55
,F45*F55,G45*G55,H45*H55,I45
*I55,J45*J55,K45*K55,L45*L55)
= B56
"/Kg
A56*C45*C55
A56*D45*D55
A56*E45*E55
A56*F45*F55
A56*G45*G55

A56*H45*H55
A56*I45*I55
A56*J45*J55
A56*K45*K55
A56*L45*L55
> SUM(C56:M56)
= B57
" Kg
= M57
SUM(C45*C57,D45*D57,E45*E57
,F45*F57,G45*G57,H45*H57,I45
*I57,J45*J57,K45*K57,L45*L57)
= B58
"/Kg
A58*C45*C57
A58*D45*D57
A58*E45*E57
A58*F45*F57
A58*G45*G57
A58*H45*H57
A58*I45*I57
A58*J45*J57
A58*K45*K57
A58*L45*L57
> SUM(C58:M58)
= B59
" Kg
= M59
SUM(C45*C59,D45*D59,E45*E59
,F45*F59,G45*G59,H45*H59,I45
*I59,J45*J59,K45*K59,L45*L59)
= B60
"/Kg
A60*C45*C59
A60*D45*D59
A60*E45*E59
A60*F45*F59
A60*G45*G59
A60*H45*H59
A60*I45*I59
A60*J45*J59
A60*K45*K59
A60*L45*L59
> SUM(C60:M60)
= B61
" Kg
= M61
SUM(C45*C61,D45*D61,E45*E61
,F45*F61,G45*G61,H45*H61,I45
*I61,J45*J61,K45*K61,L45*L61)
= B62
"/Kg
A62*C45*C61
A62*D45*D61
A62*E45*E61

EXPERIMENT BUDGET WORKSHEET

A62*F45*F61
A62*G45*G61
A62*H45*H61
A62*I45*I61
A62*J45*J61
A62*K45*K61
A62*L45*L61
> SUM(C62:M62)
= B63
" Kg
= M63
SUM(C45*C63,D45*D63,E45*E63
,F45*F63,G45*G63,H45*H63,I45
*I63,J45*J63,K45*K63,L45*L63)
= B64
"/Kg
A64*C45*C63
A64*D45*D63
A64*E45*E63
A64*F45*F63
A64*G45*G63
A64*H45*H63
A64*I45*I63
A64*J45*J63
A64*K45*K63
A64*L45*L63
> SUM(C64:M64)
= B65
" Kg
= M65
SUM(C45*C65,D45*D65,E45*E65
,F45*F65,G45*G65,H45*H65,I45
*I65,J45*J65,K45*K65,L45*L65)
= B66
"/Kg
A66*C45*C65
A66*D45*D65
A66*E45*E65
A66*F45*F65
A66*G45*G65
A66*H45*H65
A66*I45*I65
A66*J45*J65
A66*K45*K65
A66*L45*L65
> SUM(C66:M66)
= B67
" Kg
= M67
SUM(C45*C67,D45*D67,E45*E67
,F45*F67,G45*G67,H45*H67,I45
*I67,J45*J67,K45*K67,L45*L67)
= B68
"/Kg
A68*C45*C67

A68*D45*D67
A68*E45*E67
A68*F45*F67
A68*G45*G67
A68*H45*H67
A68*I45*I67
A68*J45*J67
A68*K45*K67
A68*L45*L67
> SUM(C68:M68)
= B69
" Kg
= M69
SUM(C45*C69,D45*D69,E45*E69
,F45*F69,G45*G69,H45*H69,I45
*I69,J45*J69,K45*K69,L45*L69)
= B70
"/Kg
A70*C45*C69
A70*D45*D69
A70*E45*E69
A70*F45*F69
A70*G45*G69
A70*H45*H69
A70*I45*I69
A70*J45*J69
A70*K45*K69
A70*L45*L69
> SUM(C70:M70)
= B71
" Kg
= M71
SUM(C45*C71,D45*D71,E45*E71
,F45*F71,G45*G71,H45*H71,I45
*I71,J45*J71,K45*K71,L45*L71)
= B72
"/Kg
A72*C45*C71
A72*D45*D71
A72*E45*E71
A72*F45*F71
A72*G45*G71
A72*H45*H71
A72*I45*I71
A72*J45*J71
A72*K45*K71
A72*L45*L71
> SUM(C72:M72)
= B73
" Kg
= M73
SUM(C45*C73,D45*D73,E45*E73
,F45*F73,G45*G73,H45*H73,I45
*I73,J45*J73,K45*K73,L45*L73)
= B74

EXPERIMENT BUDGET WORKSHEET

"/Kg
A74*C45*C73
A74*D45*D73
A74*E45*E73
A74*F45*F73
A74*G45*G73
A74*H45*H73
A74*I45*I73
A74*J45*J73
A74*K45*K73
A74*L45*L73
> SUM(C74:M74)
= B75
" Kg
= M75
SUM(C45*C75, D45*D75, E45*E75
, F45*F75, G45*G75, H45*H75, I45
*I75, J45*J75, K45*K75, L45*L75)
= B76
"/Kg
A76*C45*C75
A76*D45*D75
A76*E45*E75
A76*F45*F75
A76*G45*G75
A76*H45*H75
A76*I45*I75
A76*J45*J75
A76*K45*K75
A76*L45*L75
> SUM(C76:M76)
= B77
" Kg
= M77
SUM(C45*C77, D45*D77, E45*E77
, F45*F77, G45*G77, H45*H77, I45
*I77, J45*J77, K45*K77, L45*L77)
= B78
"/Kg
A78*C45*C77
A78*D45*D77
A78*E45*E77
A78*F45*F77
A78*G45*G77
A78*H45*H77
A78*I45*I77
A78*J45*J77
A78*K45*K77
A78*L45*L77
> SUM(C78:M78)
= B79
" Kg
= M79
SUM(C45*C79, D45*D79, E45*E79
, F45*F79, G45*G79, H45*H79, I45

*I79, J45*J79, K45*K79, L45*L79)
= B80
"/Kg
A80*C45*C79
A80*D45*D79
A80*E45*E79
A80*F45*F79
A80*G45*G79
A80*H45*H79
A80*I45*I79
A80*J45*J79
A80*K45*K79
A80*L45*L79
> SUM(C80:M80)
= B81
" Kg
= M81
SUM(C45*C81, D45*D81, E45*E81
, F45*F81, G45*G81, H45*H81, I45
*I81, J45*J81, K45*K81, L45*L81)
= B82
"/Kg
A82*C45*C81
A82*D45*D81
A82*E45*E81
A82*F45*F81
A82*G45*G81
A82*H45*H81
A82*I45*I81
A82*J45*J81
A82*K45*K81
A82*L45*L81
> SUM(C82:M82)
= A83
'-
= A84
"TOTAL MATERIALS
> SUM(C50, C52, C54, C56, C58, C60,
C62, C64, C66, C68, C70)
SUM(D50, D52, D54, D56, D58, D60
, D62, D64, D66, D68, D70)
SUM(E50, E52, E54, E56, E58, E60
, E62, E64, E66, E68, E70)
SUM(F50, F52, F54, F56, F58, F60
, F62, F64, F66, F68, F70)
SUM(G50, G52, G54, G56, G58, G60
, G62, G64, G66, G68, G70)
SUM(H50, H52, H54, H56, H58, H60
, H62, H64, H66, H68, H70)
SUM(I50, I52, I54, I56, I58, I60
, I62, I64, I66, I68, I70)
SUM(J50, J52, J54, J56, J58, J60
, J62, J64, J66, J68, J70)
SUM(K50, K52, K54, K56, K58, K60
, K62, K64, K66, K68, K70)

EXPERIMENT BUDGET WORKSHEET

SUM(L50,L52,L54,L56,L58,L60	B91*J44*J45
,L62,L64,L66,L68,L70)	B91*K44*K45
> SUM(N50:N82)	B91*L44*L45
= A86	> SUM(C91:M91)
"Experiment General	= C92
Expenses Budget	B92*C44*C45
= A87	B92*D44*D45
" Item	B92*E44*E45
"cost/ha	B92*F44*F45
= E87	B92*G44*G45
"cost / experiment	B92*H44*H45
= C88	B92*I44*I45
B88*C44*C45	B92*J44*J45
B88*D44*D45	B92*K44*K45
B88*E44*E45	B92*L44*L45
B88*F44*F45	> SUM(C92:M92)
B88*G44*G45	= C93
B88*H44*H45	B93*C44*C45
B88*I44*I45	B93*D44*D45
B88*J44*J45	B93*E44*E45
B88*K44*K45	B93*F44*F45
B88*L44*L45	B93*G44*G45
> SUM(C88:M88)	B93*H44*H45
= C89	B93*I44*I45
B89*C44*C45	B93*J44*J45
B89*D44*D45	B93*K44*K45
B89*E44*E45	B93*L44*L45
B89*F44*F45	> SUM(C93:M93)
B89*G44*G45	= C94
B89*H44*H45	B94*C44*C45
B89*I44*I45	B94*D44*D45
B89*J44*J45	B94*E44*E45
B89*K44*K45	B94*F44*F45
B89*L44*L45	B94*G44*G45
> SUM(C89:M89)	B94*H44*H45
= C90	B94*I44*I45
B90*C44*C45	B94*J44*J45
B90*D44*D45	B94*K44*K45
B90*E44*E45	B94*L44*L45
B90*F44*F45	> SUM(C94:M94)
B90*G44*G45	= C95
B90*H44*H45	B95*C44*C45
B90*I44*I45	B95*D44*D45
B90*J44*J45	B95*E44*E45
B90*K44*K45	B95*F44*F45
B90*L44*L45	B95*G44*G45
> SUM(C90:M90)	B95*H44*H45
= C91	B95*I44*I45
B91*C44*C45	B95*J44*J45
B91*D44*D45	B95*K44*K45
B91*E44*E45	B95*L44*L45
B91*F44*F45	> SUM(C95:M95)
B91*G44*G45	= C96
B91*H44*H45	B96*C44*C45
B91*I44*I45	B96*D44*D45

EXPERIMENT BUDGET WORKSHEET

B96*E44*E45	B100*L44*L45
B96*F44*F45	> SUM(C100:M100)
B96*G44*G45	= C101
B96*H44*H45	B101*C44*C45
B96*I44*I45	B101*D44*D45
B96*J44*J45	B101*E44*E45
B96*K44*K45	B101*F44*F45
B96*L44*L45	B101*G44*G45
> SUM(C96:M96)	B101*H44*H45
= C97	B101*I44*I45
B97*C44*C45	B101*J44*J45
B97*D44*D45	B101*K44*K45
B97*E44*E45	B101*L44*L45
B97*F44*F45	> SUM(C101:M101)
B97*G44*G45	= C102
B97*H44*H45	B102*C44*C45
B97*I44*I45	B102*D44*D45
B97*J44*J45	B102*E44*E45
B97*K44*K45	B102*F44*F45
B97*L44*L45	B102*G44*G45
> SUM(C97:M97)	B102*H44*H45
= C98	B102*I44*I45
B98*C44*C45	B102*J44*J45
B98*D44*D45	B102*K44*K45
B98*E44*E45	B102*L44*L45
B98*F44*F45	> SUM(C102:M102)
B98*G44*G45	= C103
B98*H44*H45	B103*C44*C45
B98*I44*I45	B103*D44*D45
B98*J44*J45	B103*E44*E45
B98*K44*K45	B103*F44*F45
B98*L44*L45	B103*G44*G45
> SUM(C98:M98)	B103*H44*H45
= C99	B103*I44*I45
B99*C44*C45	B103*J44*J45
B99*D44*D45	B103*K44*K45
B99*E44*E45	B103*L44*L45
B99*F44*F45	> SUM(C103:M103)
B99*G44*G45	= A104
B99*H44*H45	' -
B99*I44*I45	= A105
B99*J44*J45	"TOTAL GENERAL
B99*K44*K45	= C105
B99*L44*L45	SUM(C88:C103)
> SUM(C99:M99)	SUM(D88:D103)
= C100	SUM(E88:E103)
B100*C44*C45	SUM(F88:F103)
B100*D44*D45	SUM(G88:G103)
B100*E44*E45	SUM(H88:H103)
B100*F44*F45	SUM(I88:I103)
B100*G44*G45	SUM(J88:J103)
B100*H44*H45	SUM(K88:K103)
B100*I44*I45	SUM(L88:L103)
B100*J44*J45	> SUM(N88:N103)
B100*K44*K45	= A106

EXPERIMENT BUDGET WORKSHEET

"TOTAL VARIABLE / F E N47,T R
= C106 ! !
C84+C105 = A1
D84+D105
E84+E105
F84+F105
G84+G105
H84+H105
I84+I105
J84+J105
K84+K105
L84+L105
> SUM(C106:M106)
= A107
'-
= A109
"RATIOS
= A110
" Perm. Personnel/Total
>> E37/(E37+K37+N106)
= A111
" Capital Expenses/Total
>> K37/(E37+K37+N106)
= A112
" Variable/Total
>> N106/(E37+K37+N106)

/ P ALL

/ F G I
/ F R 44,G
/ F R 49,G
/ F R 51,G
/ F R 53,G
/ F R 55,G
/ F R 57,G
/ F R 59,G
/ F R 61,G
/ F R 63,G
/ F R 65,G
/ F R 67,G
/ F R 69,G
/ F R 71,G
/ F R 73,G
/ F R 75,G
/ F R 77,G
/ F R 79,G
/ F R 81,G
/ F E D110,\$
/ F E D111,\$
/ F E D112,\$
/ F E M7,G
/ F E M9,G
/ F E E25,T R
/ F E M47,T R

BUDGET SUMMARY

```

/ Z Y " *
/ F G 11 " *
/ F C A,15 " *
/ F C B,5 " *
/ F C C,1 " *
/ F C J,4 " *
/ F C L,2 " *
/ LB:BENITO,P K7:K19,A7 " *
/ LB:BENITO,P K7:K19,K7 " *
/ LB:BENITO,P M5:M19,D5,V " *
/ LB:TORALA,P M5:M19,E5,V " *
/ LB:SANTA ,P M5:M19,F5,V " *
/ LB:CHIPIR,P M5:M19,G5,V "***
/ LB:LAJOTA,P M5:M19,H5,V = K3
/ LB:TARRQU,P M5:M19,I5,V "SUMMARY BUDGET
/ U ALL "-----
/ F R 5,T R "Program name
/ F E J5,T L v = M5
/ F E K5,T L "ENTER NAME
/ F E N5,T L v SUM(D7:I7)
= A1 SUM(D8:I8)
" BUDGET SUMMARY SUM(D9:I9)
= E3 v SUM(D11:I11)
" PROGRAM NAME SUM(D12:I12)
v = J2 SUM(D13:I13)
" ** v SUM(D15:I15)
" * SUM(D16:I16)
" * SUM(D17:I17)
" * v SUM(D19:I19)
" * = A6
" * ' _
" * = A10
" * ' _
" * = A14
" * ' _
" * = A18
" * ' _
" * v ' _
" * = A21
" * " RATIOS
" * > = A22
" * "Perm. Personnel/Total
" * >> D11/D19
" ** E11/E19
= K2 F11/F19
"***** G11/G19
= K20 H11/H19
"***** I11/I19
= N2 >>> M11/M19
"*** = A23
" * "Capital Expen./Total
" * >> D12/D19
" * E12/E19
" * F12/F19
" * G12/G19

```

BUDGET SUMMARY

H12/H19
I12/I19
>>> M12/M19
= A24
"Variable / Total
>> D15/D19
E15/E19
F15/F19
G15/G19
H15/H19
I15/I19
>>> M15/M19
/ F G I
/ F R 22,\$
/ F R 23,\$
/ F R 24,\$
/ F R 9.G
/ F R 7.G
/ P ALL
/ U M5
= A1

PERMANENT PERSONNEL AND CAPITAL EXPENSES SUMMARY

/ Z Y
/ F G 12
/ F C A,15
/ F C B,4
/ G M
= A1
"PERMANENT PERSONNEL AND CAPITAL EXPENSES SUMMARY
= E3
"PROGRAM NAME
/ LB: BENITO, P A23:K25, A5
= A8
' -
/ LB: BENITO, P M5, A9
/ LB: BENITO, P A26:K35, A10, V
/ LB: TORALA, P M5, A21
/ LB: TORALA, P A26:K35, A22, V
/ LB: SANTA , P M5, A33
/ LB: SANTA , P A26:K35, A34, V
/ LB: CHIPIR, P M5, A45
/ LB: CHIPIR, P A26:K35, A46, V
/ LB: LAJOTA, P M5, A57
/ LB: LAJOTA, P A26:K35, A58, V
/ LB: TARRQU, P M5, A69
/ LB: TARRQU, P A26:K35, A70, V
v = A81
' -
"TOTALS
> = C82
SUM(C10:C80)
> SUM(E10:E80)
= K82
SUM(K10:K80)
= A83
"PERMANENT PERSONNEL AND CAPITAL EXPENSES COMBINED
= G83
K82+E82
= A84
' -
/ P ALL
/ G I
/ F R 7, T R
/ F E A7, T L

EXPERIMENT MATERIALS EXPENSES SUMMARY

/ Z Y	= C18
/ F G 13	C17*A18
/ F C A,15	D17*A18
/ F C B,4	E17*A18
/ G M	F17*A18
/ LB: BENITO, P A49: B82, A7	G17*A18
/ LB: BENITO, P M5, C5	H17*A18
/ LB: TORALA, P M5, D5	= C20
/ LB: SANTA , P M5, E5	C19*A20
/ LB: CHIPIR, P M5, F5	D19*A20
/ LB: LAJOTA, P M5, G5	E19*A20
/ LB: TARRQU, P M5, H5	F19*A20
/ LB: BENITO, P M49: M82, C7, V	G19*A20
/ LB: TORALA, P M49: M82, D7, V	H19*A20
/ LB: SANTA , P M49: M82, E7, V	= C22
/ LB: CHIRIR, P M49: M82, F7, V	C21*A22
/ LB: LAJOTA, P M49: M82, G7, V	D21*A22
/ LB: TARRQU, P M49: M82, H7, V	E21*A22
/ U A1: J43	F21*A22
/ F R 5. T R	G21*A22
> = C8	H21*A22
C7*A8	= C24
D7*A8	C23*A24
E7*A8	D23*A24
F7*A8	E23*A24
G7*A8	F23*A24
H7*A8	G23*A24
= C10	H23*A24
C9*A10	= C26
D9*A10	C25*A26
E9*A10	D25*A26
F9*A10	E25*A26
G9*A10	F25*A26
H9*A10	G25*A26
= C12	H25*A26
C11*A12	= C28
D11*A12	C27*A28
E11*A12	D27*A28
F11*A12	E27*A28
G11*A12	F27*A28
H11*A12	G27*A28
= C14	H27*A28
C13*A14	= C30
D13*A14	C29*A30
E13*A14	D29*A30
F13*A14	E29*A30
G13*A14	F29*A30
H13*A14	G29*A30
= C16	H29*A30
C15*A16	= C32
D15*A16	C31*A32
E15*A16	D31*A32
F15*A16	E31*A32
G15*A16	F31*A32
H15*A16	G31*A32

EXPERIMENT MATERIALS EXPENSES SUMMARY

H31*A32	v SUM(C18:H18)
= C34	v SUM(C20:H20)
C33*A34	v SUM(C22:H22)
D33*A34	v SUM(C24:H24)
E33*A34	v SUM(C26:H26)
F33*A34	v SUM(C28:H28)
G33*A34	v SUM(C30:H30)
H33*A34	v SUM(C32:H32)
= C36	v SUM(C34:H34)
C35*A36	v SUM(C36:H36)
D35*A36	v SUM(C38:H38)
E35*A36	v SUM(C40:H40)
F35*A36	= A6
G35*A36	'-
H35*A36	= A41
= C38	'-
C37*A38	"TOTAL MATERIALS
D37*A38	'-
E37*A38	> = C42
F37*A38	SUM(C8,C10,C12,C14,C16,C18,
G37*A38	C20,C22,C24,C26,C28,C30,C32
H37*A38	,C34,C36,C38,C40)
= C40	SUM(D8,D10,D12,D14,D16,D18,
C39*A40	D20,D22,D24,D26,D28,D30,D32
D39*A40	,D34,D36,D38,D40)
E39*A40	SUM(E8,E10,E12,E14,E16,E18,
F39*A40	E20,E22,E24,E26,E28,E30,E32
G39*A40	,E34,E36,E38,E40)
H39*A40	SUM(F8,F10,F12,F14,F16,F18,
v = I5	F20,F22,F24,F26,F28,F30,F32
"TOTAL Kg	,F34,F36,F38,F40)
v SUM(C7:H7)	SUM(G8,G10,G12,G14,G16,G18,
v SUM(C9:H9)	G20,G22,G24,G26,G28,G30,G32
v SUM(C11:H11)	,G34,G36,G38,G40)
v SUM(C13:H13)	SUM(H8,H10,H12,H14,H16,H18,
v SUM(C15:H15)	H20,H22,H24,H26,H28,H30,H32
v SUM(C17:H17)	,H34,H36,H38,H40)
v SUM(C19:H19)	SUM(I7:I39)
v SUM(C21:H21)	SUM(J8:J40)
v SUM(C23:H23)	= A1
v SUM(C25:H25)	"EXPERIMENT MATERIALS
v SUM(C27:H27)	EXPENSES SUMMARY
v SUM(C29:H29)	= E3
v SUM(C31:H31)	"PROGRAM NAME
v SUM(C33:H33)	/ F G I
v SUM(C35:H35)	/ F R 7,G
v SUM(C37:H37)	/ F R 9,G
v SUM(C39:H39)	/ F R 11,G
= J5	/ F R 13,G
"TOTAL COST	/ F R 15,G
v v SUM(C8:H8)	/ F R 17,G
v SUM(C10:H10)	/ F R 19,G
v SUM(C12:H12)	/ F R 21,G
v SUM(C14:H14)	/ F R 23,G
v SUM(C16:H16)	/ F R 25,G

EXPERIMENT MATERIALS EXPENSES SUMMARY

/ F R 27,G
/ F R 29,G
/ F R 31,G
/ F R 33,G
/ F R 35,G
/ F R 37,G
/ F R 39,G
/ F E I42,G
/ P A1:J43
= A1

EXPERIMENT GENERAL EXPENSES SUMMARY

/ Z Y	C7*B14
/ F G 13	D7*B14
/ F C A,15	E7*B14
/ F C B,4	F7*B14
/ G M	G7*B14
/ LB: BENITO, P A87: B104, A9	H7*B14
/ LB: BENITO, P M5, C5	SUM(C14: H14)
/ LB: TORALA, P M5, D5	= C15
/ LB: SANTA, P M5, E5	C7*B15
/ LB: CHIPIR, P M5, F5	D7*B15
/ LB: LAJOTA, P M5, G5	E7*B15
/ LB: TARRQU, P M5, H5	F7*B15
/ LB: BENITO, P N44, C7, V	G7*B15
/ LB: TORALA, P N44, D7, V	H7*B15
/ LB: SANTA, P N44, E7, V	SUM(C15: H15)
/ LB: CHIPIR, P N44, F7, V	= C16
/ LB: LAJOTA, P N44, G7, V	C7*B16
/ LB: TARRQU, P N44, H7, V	D7*B16
/ U A1: I29	E7*B16
/ F R 5, T R	F7*B16
= A7	G7*B16
"TOTAL HECTARES	H7*B16
> = C10	SUM(C16: H16)
C7*B10	= C17
D7*B10	C7*B17
E7*B10	D7*B17
F7*B10	E7*B17
G7*B10	F7*B17
H7*B10	G7*B17
SUM(C10: H10)	H7*B17
= C11	SUM(C17: H17)
C7*B11	= C18
D7*B11	C7*B18
E7*B11	D7*B18
F7*B11	E7*B18
G7*B11	F7*B18
H7*B11	G7*B18
SUM(C11: H11)	H7*B18
= C12	SUM(C18: H18)
C7*B12	= C19
D7*B12	C7*B19
E7*B12	D7*B19
F7*B12	E7*B19
G7*B12	F7*B19
H7*B12	G7*B19
SUM(C12: H12)	H7*B19
= C13	SUM(C19: H19)
C7*B13	= C20
D7*B13	C7*B20
E7*B13	D7*B20
F7*B13	E7*B20
G7*B13	F7*B20
H7*B13	G7*B20
SUM(C13: H13)	H7*B20
= C14	SUM(C20: H20)

EXPERIMENT GENERAL EXPENSES SUMMARY

= C21	SUM(D10:D25)
C7*B21	SUM(E10:E25)
D7*B21	SUM(F10:F25)
E7*B21	SUM(G10:G25)
F7*B21	SUM(H10:H25)
G7*B21	SUM(I10:I25)
H7*B21	= A28
SUM(C21:H21)	'-
= C22	/ F G I
C7*B22	/ F R 7,G
D7*B22	/ P A1:I28
E7*B22	= A1
F7*B22	
G7*B22	
H7*B22	
SUM(C22:H22)	
= C23	
C7*B23	
D7*B23	
E7*B23	
F7*B23	
G7*B23	
H7*B23	
SUM(C23:H23)	
= C24	
C7*B24	
D7*B24	
E7*B24	
F7*B24	
G7*B24	
H7*B24	
SUM(C24:H24)	
= C25	
C7*B25	
D7*B25	
E7*B25	
F7*B25	
G7*B25	
H7*B25	
SUM(C25:H25)	
= A1	
"EXPERIMENT GENERAL EXPENSES SUMMARY	
= E3	
"PROGRAM NAME	
= A6	
'-	
= A8	
'-	
= I5	
"TOTALS	
= I7	
SUM(C7:H7)	
= A27	
"TOTAL GENERAL	
> SUM(C10:C25)	

STANDARD VARIABLE EXPENSES SUMMARY

Z Y	SUM(B34:G34)
/ F G 13	SUM(B35:G35)
/ F C A,20	SUM(B36:G36)
/ G M	SUM(B37:G37)
/ LB:ADMIN ,P A48:A102,A7	SUM(B38:G38)
/ LB:ADMIN ,P M5,B5	SUM(B39:G39)
/ LB:LIBRAR,P M5,C5	SUM(B40:G40)
/ LB:SOILS ,P M5,D5	SUM(B41:G41)
/ LB:STATS ,P M5,E5	SUM(B42:G42)
/ LB:SHOP ,P M5,F5	SUM(B43:G43)
/ LB: ,P M5,G5	SUM(B44:G44)
/ LB:ADMIN ,P N48:N102,B7,V	SUM(B45:G45)
/ LB:LIBRAR,P N48:N102,C7,V	SUM(B46:G46)
/ LB:SOILS ,P N48:N102,D7,V	SUM(B47:G47)
/ LB:STATS ,P N48:N102,E7,V	SUM(B48:G48)
/ LB:SHOP ,P N48:N102,F7,V	SUM(B49:G49)
/ LB: ,P N48:N102,G7,V	SUM(B50:G50)
/ U ALL	SUM(B51:G51)
/ F R 5,T R	SUM(B52:G52)
= A1	SUM(B53:G53)
"STANDARD VARIABLE EXPENSES	SUM(B54:G54)
SUMMARY	SUM(B55:G55)
= E3	SUM(B56:G56)
"PROGRAM NAME	SUM(B57:G57)
= A6	SUM(B58:G58)
' -	SUM(B59:G59)
v = H5	SUM(B60:G60)
"TOTALS	SUM(B61:G61)
v SUM(B7:G7)	= A62
SUM(B8:G8)	' -
SUM(B9:G9)	> = A63
SUM(B10:G10)	"TOTAL MATERIALS
SUM(B11:G11)	SUM(B7:B61)
SUM(B12:G12)	SUM(C7:C61)
SUM(B13:G13)	SUM(D7:D61)
SUM(B14:G14)	SUM(E7:E61)
SUM(B15:G15)	SUM(F7:F61)
SUM(B16:G16)	SUM(G7:G61)
SUM(B17:G17)	SUM(H7:H61)
SUM(B18:G18)	= A64
SUM(B19:G19)	' -
SUM(B20:G20)	/ P ALL
SUM(B21:G21)	/ G I
SUM(B22:G22)	!
SUM(B23:G23)	= A1
SUM(B24:G24)	
SUM(B25:G25)	
SUM(B26:G26)	
SUM(B27:G27)	
SUM(B28:G28)	
SUM(B29:G29)	
SUM(B30:G30)	
SUM(B31:G31)	
SUM(B32:G32)	
SUM(B33:G33)	

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