AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523
BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY
Batch 62

1. SUBJECT CLASSIFICATION
A. PRIMARY: Food production and nutrition — AE10-0000-0000
B. SECONDARY: Agricultural economics

2. TITLE AND SUBTITLE
AGACC: Accounting routine for the agricultural sector

3. AUTHOR(S)
Pervis,D.W.; Wolf,Christopher

4. DOCUMENT DATE: 1976
5. NUMBER OF PAGES: 44p.
6. ARC NUMBER: ARC

7. REFERENCE ORGANIZATION NAME AND ADDRESS
Mich.State

8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publishers, Availability)
(In Computer Library for Agr.Systems Simulation. CLASS doc.no.10)

9. ABSTRACT In many models of socioeconomic systems, there are a number of repeated calculations which perform an accounting function. The use of AGACC(Accounting Routine for the Agricultural Sector) will ensure consistent accounting and aggregation of various parameters throughout a model. This allows comparison of the results of similar models used in different countries, or different models in the same country. AGACC calculates data on such items as the expenditures on production inputs, monetary profits, the value of production, and the consumption of products, at three aggregation levels -- enterprise, regional and national. The data requirements are classified into four categories: model size parameters, policy-determined coefficients, technology determined coefficients, and model varibles. The model size parameters include the number of regions of the country, the total number of enterprises, the number of single or multi-product enterprises,and the number of multi-product livestock enterprises. It also includes the number of products from multi-product crop and livestock enterprises, and the number of production inputs. Policy-determined coefficients require data on the tax rate on farm profits; technology determined coefficients refer to the proportions of total production lost on a farm, and the amount of nutrient in each product. The model variables are production of all products; consumption of each product; prices of production inputs and farm prices of each product; and the quantity of each production input and population sizes in each region. Mathematical calculations used in AGACC are simple arithmetic accounting calculations. The document gives indices used in these calculations, the input and output variable definitions, and mathematical calculations for each of the three aggregation levels. It also provides a sample run of the routine and a description of the programming, testing and implementations of AGACC.

10. CONTROL NUMBER
PN-AAD-981

11. PRICE OF DOCUMENT

12. DESCRIPTORS
AGACC?
Accounting
Agglomeration
Computer programs
Models
Sector analysis

13. PROJECT NUMBER

14. CONTRACT NUMBER
CSD-2975 Res.

15. TYPE OF DOCUMENT

AID 590-1 (4-74)

THIS DOCUMENT HAS BEEN EVALUATED AS SUBSTANDARD COPY FOR ROUTINE REPRODUCTION. EFFORTS IN AID/W TO OBTAIN A MORE ACCEPTABLE COPY OF THE DOCUMENT HAVE NOT BEEN SUCCESSFUL. DESPITE THIS DISADVANTAGE, WE HAVE CHOSEN TO REPRODUCE THE DOCUMENT BECAUSE OF THE SUBJECT TREATED AND TO MAKE THE DISCERNIBLE INFORMATION AVAILABLE.

AGACC:
ACCOUNTING ROUTINE FOR THE AGRICULTURAL SECTOR

Dennis Pervis

Chris Wolf

COMPUTER LIBRARY FOR AGRICULTURAL SYSTEMS SIMULATION

CLASS Document No. 10

Agricultural Sector Analysis and Simulation Projects
Supported under Contract No. AID/csd-2975
U. S. Agency for International Development

Department of Agricultural Economics
Michigan State University
East Lansing, Michigan

July 1976

CLASS Documentation

1. *Symbolic Name*	2. *Name*	3. *Type*	4. *Version No.*
AGACC	Accounting Routine for the Agricultural Sector	Routine	1A 12/1/75

AGACC Documentation

Contents

I. Problem Description 1

II. Technical Description 1

A. Mathematical calculations 1

B. Sample run 16

III. Program Information 22

A. Program description 22

B. Program implementation 22

C. Program list 26

1. Executive 26

2. Component 30

COMPUTER LIBRARY FOR AGRICULTURAL SYSTEMS SIMULATION

The Computer Library for Agricultural Systems Simulation (CLASS) is one of the four major activities of the Agricultural Sector Analysis and Simulation Projects at Michigan State Unviersity under U. S. Agency for International Development Contract AID/csd-2975. The other three major interrelated project activities include theoretical and methodological research, the Development Analysis Study Program, and field activities, primarily in the Republic of Korea.

The project objective is to develop an approach to institutionalizing an analytical capacity for planning, policy formulation, program development, and project implementation for agricultural sector development within the public decision making structure of developing countries. A major component of the analytical capacity is a series of system simulation models tailored to the needs of the individual country. Much of the experience gained from the field activity and the knowledge gained from the theoretical and methodological research added to the present stock of knowledge about building and maintaining analytical capacities for agricultural sector development can be preserved and extended in the training provided through the Development Analysis Study Program and in the stock of model, component, and utility routine computer software documented in the Computer Library for Agricultural Systems Simulation.

In full operation, the Computer Library for Agricultural Systems Simulation (CLASS) acquires, catalogs, maintains and distributes computer programs and associated documentation. These computer programs are of generalized simulation models, components, and routines designed specifically for the analysis of agricultural development problems and processes. In particular, the library sets standards of admissibility for programs and documentation; catalogs and indexes programs and documentation so as to facilitate their retrieval by users seeking a set of programs to be used in a specific problem analysis; and distributes programs and documentation to users.

To enhance the effectiveness of the library, its functions also include identifying and soliciting needed models; actively bringing programs and documentation up to the library's standards; and providing limited consultation in identifying and implementing appropriate library programs for a particular application. A subsidiary function of the library in conjunction with the identification and solicitation of models is to survey and catalog ongoing research in agricultural systems modeling and simulation.

The CLASS document publication series is the main vehicle for informing potential users of the substance of CLASS holdings and activities.

July, 1976

George E. Rossmiller
Director
Agricultural Sector Analysis and
Simulation Projects

CLASS Document

1. Symbolic Name	2. Name	3. Type	4. Version No. and Date
AGACC	Accounting Routine for the Agricultural Sector	Routine	1A 12/1/75

AGACC Abstract

The purpose of AGACC is to perform the many computations involved in the aggregation and accounting functions necessary in most models. AGACC is a SUBROUTINE subprogram to be invoked at the end of each time iteration during the execution of a model. No integration over time is done in AGACC.

The data requirements of AGACC may be classified into four categories: 1) model size parameters, 2) policy determined coefficients, 3) technology determined coefficients, and 4) model variables. The following list presents the specific data under each category.

A. Model Size Parameters

1. Number of regions of the country
2. Total number of enterprises
3. Number of single product enterprises
4. Number of multi-product crop enterprises
5. Number of multi-product livestock enterprises
6. Number of products from multi-product crop enterprises
7. Number of products from multi-product livestock enterprises
8. Number of production inputs
*9. Number of nutrients

B. Policy Determined Coefficients

*1. Tax rate on farm profits

C. Technology Determined Coefficients

1. Proportions of total production lost on farm
*2. Amounts of nutrients in each product

D. Model State Variables

1. Production of all products from each type of enterprise
*2. Rural, per-capita consumption of each product from each type of enterprise
3. Prices of production inputs
4. Farm prices of each product
5. Quantity of each production input
6. Size of rural population in each region

---

*Items which are starred are optional and may be left out of input.

The output of AGACC consists of a set of enterprise, regional, and national accounts and are summarized in the following table:

Aggregation Level of Data Calculated

Data Calculated	Aggregation Level		
	Enterprise	Regional	National
1) Expenditure on production inputs	×	×	×
2) Before tax monetary profit	×	×	×
3)*Monetary profits, net of farm profit taxes	×	×	×
4)*Profit taxes generate	×	×	×
5)*Amount of domestically produced nutrients consumed by rural population	×	×	×
6)*Rural consumption of products	×		
7)*Amount of nutrients produced	×	×	×
8) Value added	×	×	×
9) Total monetary returns from agricultural products sold outside rural areas	×	×	×
10) Value of total production evaluated at market prices	×	×	×
11)*Domestically produced per capita rural consumption of nutrients		×	×
12) National production of agricultural products			×

*items which are starred are optional and need not be calculated.

I. Problem Description

In many models of socio-economic systems there are a number of often repeated calculations which perform an accounting or aggregative function. These calculations are scattered throughout the model and may not be consistent with each other. A single separate routine to perform these calculations will insure consistent accounting and aggregation of various parameters throughout the model.

In many research problems, it is desirable to compare the results of similar models used in different countries or different models in the same country. Consistent accounting and aggregative procedures are crucial requirements for such investigations and the use of AGACC will insure such consistency.

II. Technical Description

The component is designed to be called at the end of each time iteration and the results of AGACC refer to one time-iteration only--no integration over time is done in AGACC.

A. Mathematical Calculations

The mathematical calculations used in AGACC are simple arithmetic accounting calculations. Following are three lists: a) indices used in the mathematical calculations; b) input variable definitions; and c) output variable definitions and mathematical calculations.

a) Indices Used in Mathematical Calculations

i = Region number
j = Enterprise number
k = Input number
ℓ = nutrient number
m = product number

b) Input Variable Definitions

i) Model Size Parameters

1. NCPROD = Number of Products from Multi-Product Crop Enterprises
   Single Variable
   Units--Products

2. NENT = Number of Agricultural Enterprises
   NENT = NSENT + NMCENT + NMLENT
   Single Variable
   Units--Enterprises

3. NINP = Number of Productive Inputs (Factors of Production)
   Single Variables
   Units--Inputs

4. NLPROD = Number of Livestock Products from Multi-Product Livestock Enterprises
   Single Variable
   Units--Products

5. NMCENT = Number of Multi-Product Crop Enterprises
   NMCENT = NENT - NSENT - NMLENT
   Single Variable
   Units--Enterprises

6. NMLENT = Number of Multi-Product Livestock Enterprises
   NMLENT = NENT - NSENT - NMCENT
   Single Variable
   Units--Enterprises

7. NNRINP = Number of Productive Inputs Which Do not Receive Wages, Profits, Rents or Interest
   Single Variable
   Units--Nutrients

8. NNUT = Number of Nutrients
   Single Variable
   Units--Nutrients

9. NREG = Number of Regions
   Single Variable
   Units--Regions

10. NSENT = Number of Single Product Enterprises
    Single Variable
    NSENT = NENT - NMCENT - NMLENT
    Units--Enterprises

ii) Other Data from the Model

1. OUTCM = Production of Multi-Product Crop Enterprises
   Triple Dimensioned Array
   Sizes of Dimensions (NREG, NMCENT, NCPROD)
   Units--Units of Products

2. OUTLM = Production of Multi-Product Livestock Enterprises
   Triple Dimensioned Array
   Sizes of Dimensions (NREG, NMLENT, NLPROD)
   Units--Units of Product

3. OUTS = Production of Single Product Agricultural Enterprises
   Double Dimensioned Array
   Sizes of Dimensions (NREG, NSENT)
   Units--Units of Product

4. PCCONC = Rural, Per Capita Consumption of Products from Multi-Product Crop Enterprises
   Triple Dimensioned Array
   Sizes of Dimensions (NREG, NMCENT, NCPROD)
   Units--Units of Product

5. PCCONL = Rural, Per Capita Consumption of Products from Multi-Product Livestock Enterprises
   Triple Dimensioned Array
   Sizes of Dimensions (NREG, NMLENT, NCPROD)
   Units--Units of Product

6. PCCONS = Rural, Per Capita Consumption of Product from Single Product Enterprises
   Double Dimensioned Array
   Sizes of Arrays (NREG, NSENT)
   Units--Units of Product

7. PFLOSC = Proportion of Total Production of Products from Multi-Product Crop Enterprise Lost on Farm
   Double Dimensioned Array
   Sizes of Dimensions (NMCENT, NCPROD)
   Units--None

8. PFLOSL = Proportion of Total Production of Products from Multi-Product Livestock Enterprises Lost on Farm
   Double Dimensioned Array
   Sizes of Dimensions (NMLENT, NLPROD)
   Units--None

9. PFLOSS = Proportion of Total Production of Products from Single-Product Enterprises Lost on the Farm
   Single Dimensioned Array
   Size of Dimension (NSENT)
   Units--None

10. PRINP = Prices of Production Inputs (Factors of Production)
Double Dimensioned Array
Sizes of Dimensions (NREG, NINP)
Units--Units of Market Value

11. PRPC = Farm Prices of Agricultural Products from Multi-Product Crop Enterprises
Triple Dimensioned Array
Sizes of Dimensions (NREG, NMCENT, NCPROD)
Units--Units of Market Value

12. PRPL = Farm Prices of Agricultural Products from Multi-Product Livestock Enterprises
Triple Dimensioned Array
Sizes of Dimensions (NREG, NMLENT, NLPROD)
Units--Units of Market Value

13. PRPS = Farm Prices of Agricultural Products from Single-Product Enterprises
Double Dimensioned Array
Sizes of Dimensions (NREG, NSENT)
Units--Units of Value

14. RINP = Quantity of Each Production Input (Factor of Production) Used in Each Enterprise
Triple Dimensioned Array
Sizes of Dimensions (NREG, NENT, NINP)
Units--Units of Inputs

15. RNUTC = Amounts of Nutrients in Products from Multi-Product Crop Enterprises
Triple Dimensioned Array
Sizes of Dimensions (NMCENT, NCPROD, NNUT)
Units--Units of Nutrients per Unit of Product

16. RNUTL = Amounts of Nutrients in Products from Multi-Product Livestock Enterprises
Triple Dimensioned Array
Sizes of Dimensions (NMLENT, NLPROD, NNUT)
Units--Units of Nutrients Per Unit of Products

17. RNUTS = Amounts of Nutrients in Products from Single Product Enterprises
Double Dimensioned Array
Sizes of Dimensions (NSENT, NNUT)
Units--Units of Nutrients Per Unit of Product

18. RPOP = Population in Rural Areas
Single Dimensioned Array
Size of Dimension (NREG)
Units--Persons

19. RTAX = Tax Rate on Farm Profits
Double Dimensioned Array
Sizes of Dimensions (NREG, NENT)
Units--None

c) <u>Output Variable Definitions and Mathematical Calculations</u>

i) Enterprise Accounting

1. EXPE = Expenditures on Production Inputs (Factors of Production)
Triple Dimensioned Array
Sizes of Dimensions (NREG, NENT, NINP)
Units--Units of Market Value

$$EXPE_{ijk} = RINP_{ijk} * PRINP$$

where:

i = 1,NREG
j = 1,NENT
k = 1,NINP

2. PFT = Before Tax Monetary Profit from Enterprises
Double Dimensioned Array
Sizes of Dimensions (NREG, NENT)
Units--Units of Market Value

$$PFT_{ij} = YC_{ij} - \sum_k EXPE_{ijk}$$

where:

i = 1,NREG
j = 1,NENT
k = 1,NINP

3. PFTN = Monetary Profits, Net of Farm Profit Taxes, from Enterprises
Double Dimensioned Array
Sizes of Dimensions (NREG, NENT)
Units--Units of Market Value

$$PFTN_{ij} = PFT_{ij} - PTAX_{ij}$$

where:

i = 1,NREG
j = 1,NENT

4. PTAX = Profit Taxes Generated from Enterprises
Double Dimensioned Array
Sizes of Dimensions (NREG, NENT)
Units--Units of Market Value

$PTAX_{ij} = RTAX_{ij} * PFT_{ij}$

where:

$i = 1,NREG$
$j = 1,NENT$

5. RCNUT = Amount of Domestically Produced Nutrients Consumed by the Rural Population--by Enterprise and Region of Origin
Triple Dimensioned Array
Sizes of Dimensions (NREG, NENT, NNUT)
Units--Units of Nutrients (varies with nutrient)

- Single Product Enterprises

$RCNUT_{ij\ell} = RCONCS_{ij} * RNUTS_{j\ell}$

where:

$i = 1,NREG$
$j = 1,NSENT$
$\ell = 1,NNUT$

- Multi-Product Crop Enterprises

$RCNUT_{i,j+NMSENT,\ell} = \sum_{m} (RCONCC_{ijm} * PNUTC_{jm\ell})$

where:

$i = 1,NREG$
$j = 1,NMCENT$
$\ell = 1,NNUT$
$m = 1,NCPROD$

- Multi-Product Livestock Enterprises

$RCNUT_{i,j+NSENT+NMCENT,\ell} = \sum_{m} (RCONCL_{ijm} * RNUTL_{jm\ell})$

where:

$i = 1,NREG$
$j = 1,NMLENT$
$\ell = 1,NNUT$
$m = 1,NLPROD$

6a. RCONCC = Rural Consumption of Products from Multi-Product Crop Enterprises
Triple Dimensioned Array
Sizes of Dimensions (NREG, NMCENT, NCPROD)
Units--Units of Products

6b. RCONCL = Rural Consumption of Product from Multi-Product Livestock Enterprises
Triple Dimensioned Array
Sizes of Dimensions (NREG, NMLENT, NLPROD)
Units--Units of Product

6c. RCONCS = Rural Consumption of Agricultural Products from Single Product Enterprises
Double Dimensioned Array
Sizes of Dimensions (NREG, NSENT)
Units--Units of Product

- Single-Product Enterprises

$$RCONCS_{ij} = PCCONS_{ij} * RPOP_i$$

where:

$i = 1, NREG$
$j = 1, NSENT$

- Multi-Product Crop Enterprises

$$RCONCC_{ijm} = PCCONC_{ijm} * RPOP_i$$

where:

$i = 1, NREG$
$j = 1, NMCENT$
$m = 1, NCPROD$

- Multi-Product Livestock Enterprise

$$RCONCL_{ijm} = PCCONL_{ijm} * RPOP_i$$

where:

$i = 1, NREG$
$j = 1, NMLENT$
$m = 1, NLPROD$

7. TNUT = Amount of Nutrients Produced by Enterprises
Triple Dimensioned Array
Sizes of Dimensions (NREG, NENT, NNUT)
Units--Units of Nutrients

- Single-Product Enterprises

$$TNUT_{ij\ell} = OUTS_{ij} * RNUTS_{j\ell}$$

where:

$i = 1,NREG$
$j = 1,NSENT$
$\ell = 1,NNUT$

- Multi-Product Crop Enterprises

$$TNUT_{i,j+NSENT,\ell} = \sum_{m} (OUTCM_{ijm} * RNUTC_{jm\ell})$$

where:

$i = 1,NREG$
$j = 1,NMCENT$
$\ell = 1,NNUT$
$m = 1,NCPROD$

- Multi-Product Livestock Enterprises

$$TNUT_{i,j+NSENT+NMCENT,\ell} = \sum_{m} (OUTLM_{ijm} * RNUTL_{jm\ell})$$

where:

$i = 1,NREG$
$j = 1,NMLENT$
$\ell = 1,NNUT$
$m = 1,NLPROD$

8. VALAD = Value Added in Agricultural Enterprises
Double Dimensioned Array
Sizes of Dimensions (NREG, NENT)
Units--Units of Market Value

$$VALAD_{ij} = YGA_{ij} - \sum_{k} EXPE_{ijk}$$

where:

$i = 1,NREG$
$j = 1,NENT$
$k = 1,NNRINP$

9. YC = Total Monetary Returns from Agricultural Products Sold off Farms
Double Dimensioned Array
Sizes of Dimensions (NREG, NENT)
Units--Units of Market Value

- Single-Product Enterprises

$$YC_{ij} = ((OUTS_{ij}*(1-PFLOSS_j)) - RCONCS_{ij})*PRPS_{ij}$$

where:

$i = 1,NREG$
$j = 1,NSENT$

- Multi-Product Crop Enterprises

$$YC_{i,j+NSENT} = \sum_m (((OUTCM_{ijm}*(1-PFLOSC_{jm})) - RCONCC_{ijm})*PRPC_{ijm})$$

where:

$i = 1,NREG$
$j = NSENT+1, NSENT+NMCENT$
$m = 1,NCPROD$

- Multi-Product Livestock Enterprises

$$YC_{i,j+NSENT+NMCENT} = \sum_m (((OUTLM_{ijm}*(1-PFLOSL_{jm})) - RCONL_{ijm})*PRPL_{ijm})$$

where:

$i = 1,NREG$
$j = 1,NMLENT$
$m = 1,NLPROD$

10. YGA = Value of Total Enterprise Production (net of farm loss) Evaluated at Market Prices
Double Dimensioned Array
Sizes of Dimensions (NREG, NENT)
Units--Units of Market Value

- Single-Product Enterprises

$$YGA_{ij} = (OUTS_{ij}*(1-PFLOSS_j))*PRPS_{ij}$$

where:

$i = 1,NREG$
$j = 1,NSENT$

- Multi-Product Crop Enterprises

$$YGA_{i,j+NSENT} = \sum_m ((OUTCM_{ijm}*(1-PFLOSC_{jm}))*PRP_{ijm})$$

where:

$i = 1,NREG$
$j = 1,NMCENT$
$m = 1,NCPROD$

- Multi-Product Livestock Enterprises

$$YGA_{i,j+NSENT+NMCENT} = \sum_{m} ((OUTLM_{ijm}*(1-PFLOSL_{jm}))*PRPL_{ijm})$$

where:

i = 1,NREG
j = 1,NMLENT
m = 1,NLPROD

ii) Regional Accounting

1. REXPE = Regional Expenditures on Production Inputs
Single Dimensioned Array
Size of Dimension (NREG)
Units--Units of Market Value

$$REXPE_i = \sum_k \sum_j EXPE_{ijk}$$

where:

i = NREG
j = 1,NENT
k = 1,NINP

2. RPCNUT = Domestically Produced Per Capita Rural Consumption of Nutrients by Region
Double Dimensioned Array
Sizes of Dimensions (NREG, NNUT)
Units--Units of Nutrients

$$RPCNUT_{i\ell} = RCNUT_{i\ell}/RPOP_i$$

where:

i = 1,NREG
ℓ = 1,NNUT

3. RPFT = Regional, Before Tax, Monetary Profit from Agriculture
Single Dimensioned Array
Size of Dimension (NREG)
Units--Units of Market Value

$$RPFT_i = \sum_j PFT_{ij}$$

where:

i = 1,NREG
j = 1,NENT

4. RPFTN = Regional Monetary Profits, Net of Farm Profit Taxes
Single Dimensioned Array
Size of Dimension (NREG)
Units--Units of Market Value

$$RPFTN_i = \sum_j PFTN_{ij}$$

where:

$i = 1,NREG$
$j = 1,NENT$

5. RPTAX = Regional Profit Taxes Generated from Agriculture
Single Dimensioned Array
Size of Array (NREG)
Units--Units of Market Value

$$RPTAX_i = \sum_j PTAX_{ij}$$

where:

$i = 1,NREG$
$j = 1,NENT$

6. RRCNUT = Amount of Nutrients Consumed by the Rural Population in Region of Origin
Double Dimensioned Array
Size of Dimensions (NREG, NNUT)
Units--Units of Nutrients

$$RRCNUT_{i\ell} = \sum_j RCNUT_{ij\ell}$$

where:

$i = 1,NREG$
$j = 1,NENT$
$\ell = 1,NNUT$

7. RTNUT = Amount of Nutrients Produced in Regions
Double Dimensioned Array
Sizes of Dimensions (NREG, NNUT)
Units--Units of Nutrients

$$RTNUT_{i\ell} = \sum_j TNUT_{ij\ell}$$

where:

$i = 1,NREG$
$j = 1,NENT$
$\ell = 1,NNUT$

8. RVALAD = Regional Value Added in Agriculture
Single Dimensioned Array
Size of Dimension (NREG)
Units--Units of Market Value

$$RVALAD_i = \sum_j VALAD_{ij}$$

where:

$i = 1,NREG$
$j = 1,NENT$

9. RYC = Regional Monetary Returns from Agricultural Products Sold Outside Rural Areas of Origin
Single Dimensioned Array
Size of Dimension (NREG)
Units--Units of Market Value

$$RYC_i = \sum_j YC_{ij}$$

where:

$i = 1,NREG$
$j = 1,NENT$

10. RYGA = Regional Value of Total Agricultural Production Evaluated at Market Prices
Single Dimensioned Array
Size of Array (NREG)
Units--Units of Market Value

$$RYGA_i = \sum_j YGA_{ij}$$

where:

$i = 1,NREG$
$j = 1,NENT$

(iii) National Agricultural Accounting

1. AEXPE = National Expenditures on Production Inputs to Agricultural Production
Single Variable
Units--Units of Market Value

$$AEXPE = \sum_i REXPE_i$$

where:

$i = 1,NREG$

2. AOUTCM = National Production of Multi-Product Crop Enterprises
Double Dimensioned Array
Size of Dimension (NMCENT, NCPROD)
Units--Units of Product

$$AOUTCM_{jm} = \sum_{i} OUTCM_{ijm}$$

where:

i = 1,NREG
j = 1,NMCENT
m = 1,NCPROD

3. AOUTLM = National Production of Multi-Product Livestock Enterprises
Double Dimensioned Array
Size of Dimensions (NMLENT, NLPROD)
Units--Units of Product

$$AOUTLM_{jm} = \sum_{i} OUTLM_{ijm}$$

where:

i = 1,NREG
j = 1,NMCENT
m = 1,NCPROD

4. AOUTS = National Production of Single Product Enterprises
Single Dimensioned Array
Size of Dimension (NSENT)
Units--Units of Product

$$AOUTS_{j} = \sum_{i} OUTS_{ij}$$

where:

i = 1,NREG
j = 1,NSENT

5. APCNUT = National Per Capita Rural Consumption of Nutrients of Domestic Origin
Single Dimensioned Array
Size of Dimension (NNUT)
Units--Units of Nutrient Per Person

$$APCNUT_{\ell} = ATNUT_{\ell}/(\sum_{i} RPOP_{i})$$

where:

i = 1,NREG
ℓ = 1,NNUT

6. APFT = Total Monetary Profits in National Agriculture
Single Variable
Units--Units of Market Value

$$APFT = \sum_i RPFT_i$$

where:

$i = 1,NREG$

7. APFTN = Monetary Profits in National Agriculture, Net of Profit Taxes
Single Variable
Units--Units of Market Value

$$APFTN = \sum_i RPFTN_i$$

where:

$i = 1,NREG$

8. APTAX = National Profit Taxes Generated from Agriculture
Single Variable
Units--Units of Market Value

$$APTAX = \sum_i RPTAX_i$$

where:

$i = 1,NREG$

9. ARCNUT = Total Rural Consumption of Nutrients of Domestic Origin
Single Dimensioned Array
Size of Array (NNUT)
Units--Units of Nutrients

$$ARCNUT_\ell = \sum_i RRCNUT_{i\ell}$$

where:

$i = 1,NREG$
$\ell = 1,NNUT$

10. ATNUT = Total Nutrients Produced by National Agriculture
Single Dimensioned Array
Size of Dimension (NNUT)
Units--Units of Nutrients

$$ATNUT_\ell = \sum_i RTNUT_{i\ell}$$

where:

$i = 1,NREG$
$\ell = 1,NNUT$

11. AVALAD = National Value Added in Agriculture
Single Variable
Units--Units of Market Value

$$AVALAD = \sum_i RVALAD_i$$

where:

$i = 1,NREG$

12. AYC = National Monetary Returns from Agricultural Products Sold Outside Regions of Origin
Single Variable
Units--Units of Market Value

$$AYC = \sum_i RYC_i$$

where:

$i = 1,NREG$

13. AYGA = National Value of Total Agricultural Production Evaluated at Market Prices
Single Variable
Units--Units of Market Value

$$AYGA = \sum_i RYGA_i$$

where:

$i = 1,NREG$

B. Sample Run

ENTERPRISE ACCOUNTING VARIABLES

GROSS INCOME FROM AGRICULTURE (YGA)

ENTERPRISE

REG	1	2	3	4	5	6	7
1	1282107.	1390468.	949162.	[illegible]	528080.	624959.	[illegible]
2	2446146.	3043803.	[illegible]	[illegible]	944374.	1157881.	[illegible]
3	582000.	503247.	.	407172.	3784352.	1779806.	1245286.

VALUE ADDED IN AG ENTERPRISES (VALAD)

ENTERPRISE

REG	1	2	3	4	5	6	7
1	772107.	850468.	449162.	306998.	138080.	284959.	1522837.
2	2179746.	2736803.	802103.	195827.	719074.	951881.	622664.
3	223000.	196247.	-285000.	37172.	3438352.	1392806.	899286.

TOTAL MONEY INCOME FROM AGRICULTURE (YC)

ENTERPRISE

REG	1	2	3	4	5	6	7
1	516087.	557948.	506662.	461432.	433330.	339459.	302837.
2	1143216.	1579353.	548788.	299987.	224574.	-135119.	210164.
3	332000.	309547.	.	373532.	3274652.	388556.	347286.

PROFIT FROM AGRICULTURE (PFT)

ENTERPRISE

REG	1	2	3	4	5	6	7
1	5787.	17748.	6412.	41082.	42880.	-991.	2337.
2	876366.	1271978.	251889.	1712.	-1751.	-341869.	-37111.
3	-27540.	2007.	-285420.	2932.	2927332.	296.	-34.

PRODUCER TAX ON AGRICULTURAL PROFIT (PTAX)

ENTERPRISE

REG	1	2	3	4	5	6	7
1	868.	3017.	641.	8216.	.	.	.
2	131455.	216236.	25189.	342.	.	.	.
3	.	341.	.	586.	.	.	.

PROFIT, NET OF PRODUCER TAXES (PFTN)

ENTERPRISE

REG	1	2	3	4	5	6	7
1	4919.	14731.	5771.	32866.	42880.	-991.	2337.
2	744911.	1055742.	226699.	1370.	-1751.	-341869.	-37111.
3	-27540.	1666.	-285420.	2346.	2927332.	296.	-34.

EXPENDITURES ON AGRICULTURAL INPUTS (EXPE)

REGION 1

ENTERPRISE

PROD	1	2	3	4	5	6	7
1	450000.	500000.	450000.	350000.	300000.	250000.	200000.
2	60000.	40000.	50000.	70000.	90000.	90000.	100000.
3	300.	200.	250.	350.	450.	450.	500.

REGION 2
ENTERPRISE

POD	1	2	3	4	5	6	7
1	204000.	255000.	255000.	304000.	153000.	102000.	153000.
2	62400.	52000.	41600.	93600.	72800.	104000.	93600.
3	450.	375.	300.	675.	525.	750.	675.

REGION 3
ENTERPRISE

POD	1	2	3	4	5	6	7
1	260000.	208000.	208000.	260000.	104000.	156000.	104000.
2	99000.	99000.	77000.	110000.	242000.	231000.	242000.
3	540.	540.	420.	600.	1320.	1260.	1320.

RURAL CONSUMPTION OF NUTRIENTS (RCNUT)

REGION 1
ENTERPRISE

NUT	1	2	3	4	5	6	7
1	18309.	17732.	17000.	16360.	3750.	7000.	11500.
2	362.	588.	1000.	370.	550.	2000.	2300.
3	.	.	5000.	4740.	2250.	4000.	6050.
4	8.	18.	27.	26.	11.	23.	31.

REGION 2
ENTERPRISE

NUT	1	2	3	4	5	6	7
1	33387.	33247.	31110.	31800.	32250.	21000.	29100.
2	660.	1102.	1830.	1800.	3750.	6000.	6150.
3	.	.	9150.	9360.	19350.	12000.	15510.
4	15.	33.	49.	51.	98.	68.	79.

REGION 3
ENTERPRISE

NUT	1	2	3	4	5	6	7
1	4487.	4433.	4930.	10060.	7750.	4900.	12800.
2	89.	147.	290.	557.	1650.	1400.	2800.
3	.	.	1450.	2945.	4650.	2800.	6880.
4	2.	4.	8.	16.	24.	16.	35.

PRODUCTION OF NUTRIENTS (TNUT)

REGION 1
ENTERPRISE

NUT	1	2	3	4	5	6	7
1	31592.	30690.	37400.	46000.	21050.	15400.	13950.
2	625.	1017.	2200.	2500.	2350.	4400.	2800.
3	.	.	11000.	13400.	12630.	8800.	7345.
4	14.	31.	59.	74.	63.	49.	38.

REGION 2
ENTERPRISE

NUT	1	2	3	4	5	6	7
1	64620.	71610.	63750.	81500.	42550.	18900.	39000.
2	1278.	2373.	3750.	4250.	4850.	5400.	8100.
3	.	.	18750.	23500.	25530.	10800.	20700.
4	29.	71.	101.	132.	128.	61.	106.

REGION 3
ENTERPRISE

NUT	1	2	3	4	5	6	7
1	4487.	4433.	4430.	10[illegible]0.	7750.	4900.	12[illegible]0.
2	89.	147.	290.	557.	1650.	1400.	2800.
3	.	.	1450.	2945.	4650.	2800.	6880.
4	2.	4.	8.	16.	24.	16.	35.

PRODUCTION OF NUTRIENTS (TNUT)

REGION 1
ENTERPRISE

NUT	1	2	3	4	5	6	7
1	31592.	30690.	37400.	46000.	21050.	15400.	13950.
2	625.	1017.	2200.	2500.	2350.	4400.	2800.
3	.	.	11000.	13400.	12630.	8800.	7345.
4	14.	31.	59.	74.	63.	49.	38.

REGION 2
ENTERPRISE

NUT	1	2	3	4	5	6	7
1	64620.	71610.	63750.	31500.	42550.	18900.	39000.
2	1278.	2373.	3750.	4250.	4850.	5400.	8100.
3	.	.	18750.	23500.	25530.	10800.	20700.
4	29.	71.	101.	132.	128.	61.	106.

REGION 3
ENTERPRISE

NUT	1	2	3	4	5	6	7
1	10770.	11935.	.	124000.	65400.	6300.	17940.
2	213.	395.	.	6500.	7800.	1800.	3960.
3	.	.	.	35800.	39240.	3600.	9624.
4	5.	12.	.	201.	198.	20.	48.

RURAL CONSUMPTION -- SINGLE-PRODUCT ENTERPRISES (RCONCS)

REGION 1
ENTERPRISE

1	2	3
5100.	5200.	5000.

REGION 2
ENTERPRISE

1	2	3
9300.	9750.	9150.

REGION 3
ENTERPRISE

1	2	3
1250.	1300.	1450.

RURAL CONSUMPTION -- MULTI-PRODUCT CROP ENTERPRISES (RCONCC)

REGION 1
ENTERPRISE

PROD	1
1	3800.
2	1200.

REGION 2
ENTERPRISE

PROD	1
1	6000.
2	3600.

REGION 3
ENTERPRISE

PROD	1
1	2050.
2	1000.

RURAL CONSUMPTION -- MULTI-PRODUCT LIVESTOCK ENTERPRISES (RCONCL)

REGION 1
ENTERPRISE

PROD	1	2	3
1	1500.	.	.
2	500.	5000.	2000.
3	.	.	5000.

REGION 2
ENTERPRISE

PROD	1	2	3
1	15000.	.	.
2	1500.	15000.	7500.
3	.	.	10500.

REGION 3
ENTERPRISE

PROD	1	2	3
1	2000.	.	.
2	2500.	3500.	4000.
3	.	.	4000.

----------REGIONAL ACCOUNTING VARIABLES----------

REG	GROSS INCOME (RYGA)	VALUE ADDED (RVALAD)	MONEY INCOME (RYC)
1	7324607.	4324607.	3117757.
2	10053499.	8207499.	3870964.
3	8301864.	5901864.	5025574.

REG	PROFIT (RPFT)	PRODUCER TAXES (RPTAX)	NET PROFIT (RPFTN)	EXPENDITURES (REXPE)
1	115257.	12743.	102514.	3002500.
2	2021214.	373222.	1647992.	1849750.
3	2619574.	928.	2618646.	2406000.

RURAL CONSUMPTION OF NUTRIENTS (RRCNUT)

REG	NUTRIENT 1	2	3	4
1	91651.	7670.	22040.	145.
2	211894.	21292.	65370.	393.
3	49360.	6933.	18725.	106.

PER CAPITA RURAL CONSUMPTION OF NUTRIENTS (PPCNUT)

	NUTRIENT			
REG	1	2	3	4
1	91.65	7.67	22.04	.14
2	141.26	14.19	43.58	.26
3	98.72	13.67	37.45	.21

PRODUCTION OF NUTRIENTS (RTNUT)

	NUTRIENT			
REG	1	2	3	4
1	196082.	15892.	53175.	330.
2	381930.	30001.	99280.	629.
3	236245.	20668.	98264.	484.

----------NATIONAL ACCOUNTING VARIABLES----------

GROSS INCOME (AIGA)	25679971.
VALUE ADDED (AVALAD)	18433971.
MONEY INCOME (AYC)	12014296.
PROFIT (APFT)	4756046.
PRODUCER TAXES (APTAX)	386893.
NET PROFIT (APFTN)	4369153.
EXPENDITURES (AE/PE)	7258250.

NUT	RURAL CONSUMPTION OF NUTRIENTS (ARCNUT)	PER CAPITA RURAL CONSUMPTION OF NUTRIENTS (APCNUT)	PRODUCTION OF NUTRIENTS (ATNUT)
1	352906.	117.64	814257.
2	35895.	11.96	66561.
3	106135.	35.38	240719.
4	644.	.21	1443.

TOTAL PRODUCTION -- SINGLE-PRODUCT ENTERPRISES (AOUTS)

ENTERPRISE		
1	2	3
29800.0	33500.0	29750.0

TOTAL PRODUCTION -- MULTI-PRODUCT CROP ENTERPRISES (AOUTCM)

	ENTERPRISE
PROD	1
1	60000.0
2	17000.0

TOTAL PRODUCTION -- MULTI-PRODUCT LIVESTOCK ENTERPRISES (AOUTLM)

	ENTERPRISE		
PROD	1	2	3
1	60000.0	.0	.0
2	6000.0	23000.0	17500.0
3	.0	.0	26200.0

STOP
OK-

III. Program Information

A. Program Description

AGACC was programmed and tested in the following operating environment:

Machine: CDC 6500
Operating system: MSU Hustler 2 L239 LSD 36--an extension of CDC Scope 3.2
Compiler: CDC FTN V3.0-P380
Core requirements: 319 words
CP compile time: 3.21 sec.
CP execution time: .018 sec.
Tapes: none
Direct access files: none
FORTRAN library subprograms used: none

AGACC is a single subroutine which is designed to perform an accounting function for a simulation model.

Five COMMON blocks are used by AGACC for the sample run. Their names and contents are as follows:

1. ACCOUN contains variables specifying the sizes of arrays in the other COMMON blocks and logical variables specifying which calculations should be done.
2. ACCIN contains all of the input data arrays which are used in calculations.
3. ENTACC contains the output from the enterprise accounting calculations.
4. REGACC contains the output from the regional accounting calculations.
5. NATACC contains the output from the national accounting calculations.

B. Program Implementation

All inputs and outputs are transmitted through the COMMON blocks and no logical I/O units are used by AGACC. It is invoked by a simple call statement:

```
CALL AGACC
```

The following logical variables are used to control which computations are done:

LCON = Indicates if food consumption output is to be calculated
Single Logical Variable
.TRUE. indicates that consumption output is to be calculated
.FALSE. indicates that consumption output is not to be calculated

LNUT = Indicates if nutritional output is to be calculated
Single Logical Variable
.TRUE. indicates that nutritional output is to be calculated
.FALSE. indicates that nutritional output is not to be calculated

LTAX = Indicates if tax related accounting is to be carried out
Single Logical Variable
.TRUE. indicates that tax related accounting is to take place
.FALSE. indicates that tax related accounting is not to take place

When variables LCON, LNUT, and LTAX are all set to .TRUE. all of the accounting calculations in the program will be performed and all input values must be supplied. Table 1 indicates which inputs are not required and which outputs are not calculated when each of the logical variables is set to .FALSE.

(ii) COMMON block ACCIN contains the following raw data

The following conventions for the structure of arrays must be followed:

1. For all arrays with the dimension NENT (number of enterprises) the enterprises shall be arranged in the following order:

   First: Single-Product enterprises (1,NSENT)

   Second: Multi-product crop enterprises (NSENT+1, NSENT+NMCENT)

   Third: Multi-product livestock enterprises (NSENT+NMCENT+1,NENT)

2. For all arrays with the dimension NINP (Number of productive inputs)

   First: Inputs which do not receive wages, rents, interest or profits (1,NNRINP)

Table 1

Variable which is set to .FALSE.	Input Variables not used	Output Variables not calculated	Output Variables Automatically set to zero
LCON	PCCONS PCCONC PCCONL		RCONCS RCONCC RCONCL RCNUT RRCNUT ARCNUT RPCNUT APCNUT
LNUT	NNUT RNUTS RNUTC RNUTL	TNUT RTNUT ATNUT RCNUT RRCNUT ARCNUT RPCNUT APCNUT	
LTAX	RTAX	PTAX RPTAX APTAX PFTN RPFTN APFTN	

Second: Inputs which do receive wages, rents, interest and profit (NNRINP+1, NINP)

The following restrictions on variable values must be observed:

1. All of the variables in COMMON block ACCOUN which specify array dimensions must be greater than zero.
2. RPOP must be greater than zero.
3. PFLOSS, PFLOSC, and PFLOSL must be less than or equal to one.

C. Program List

1. Executive

```
      PROGRAM TSTACC(OUTPUT,TAPE2=OUTPUT)
      COMMON /ACCOUN/ LCON, LNUT, LTAX, NCPROD, NENT, NINP, NLPROD,
     +                NMCENT, NMLENT, NNRINP, NNUT, NREG, NSENT
      COMMON /ACCIN/  OUTCM(3,1,2), OUTLM(3,3,3), OUTS(3,3),
     +                RCCONC(3,1,2), RCCONL(3,3,3), RCCONS(3,3),
     +                RELOSC(1,2), RELOSL(3,3), RELOSS(3), RRINP(3,3),
     +                RRPC(3,1,2), RRPL(3,3,3), RRPS(3,3),
     +                RINP(3,7,3), RNUTC(1,2,4), RNUTL(3,3,4),
     +                RNUTS(3,4), RPOP(3), RTAX(3,7)
      COMMON /ENTACC/ EXPE(3,7,3), RET(3,7), RETN(3,7), RTAX(3,7),
     +                RCNUT(3,7,4), RCONCC(3,1,2), RCONCL(3,3,3),
     +                RCONCS(3,3), TNUT(3,7,4),
     +                VALAD(3,7), YC(3,7), YGA(3,7)
      COMMON /REGACC/ REXPE(3), RRCNUT(3,4), RRET(3), RRETN(3),
     +                RRTAX(3), RRCNUT(3,4), RTNUT(3,4), RVALAD(3),
     +                RYC(3), RYGA(3)
      COMMON /NATACC/ AEXPE, AOUTCM(1,2), AOUTLM(3,3), AOUTS(3),
     +                ARCNUT(4), ARET, ARETN, ARTAX, ARCNUT(4),
     +                ATNUT(4), AVALAD, AYC, AYGA
      LOGICAL LCON, LNUT, LTAX
      DATA NREG,NINP,NNRINP,NNUT,NCPROD,NLPROD / 3, 3, 2, 4, 2, 3 /
      DATA NSENT,NMCENT,NMLENT,NENT / 3, 1, 3, 7 /
      DATA LCON,LNUT,LTAX / .TRUE., .TRUE., .TRUE. /
      DATA RINP / 9000., 4000., 5000.,      10000., 5000., 4000.,
     1            9000., 5000., 4000.,       7000., 4000., 5000.,
     2            5000., 3000., 2000.,       5000., 2000., 3000.,
     3            4000., 3000., 2000.,        600.,  500.,  900.,
     4             400.,  500.,  900.,        500.,  400.,  700.,
     5             700.,  900., 1000.,        900.,  700., 2200.,
     6             900., 1000., 2100.,       1000.,  900., 2200.,
     7            3000., 3000., 4500.,       2000., 2500., 4500.,
     8            2500., 2000., 3500.,       3500., 4500., 5000.,
     9            4500., 3500.,11000.,       4500., 5000.,10500.,
     0            5000., 4500.,11000. /
      DATA RRINP /  50., 51., 52., 100., 104., 110., .10, .15, .12 /
      DATA OUTS / 8800., 18000., 3000.,   9000., 21000., 3500.,
     1           11000., 18750.,     0. /
      DATA RNUTS / 3.59, 3.41, 3.40,     .071, .113, .230,
     1              0.,    0.,   1.,      .0016, .0034, .0054 /
      DATA OUTCM / 10000., 20000., 30000., 4000., 5000., 8000. /
      DATA RNUTC / 3.2, 3.5, .15, .25, .9, 1.1, .0052, .0056 /
      DATA OUTLM / 10000., 20000., 30000.,      0.,      0.,      0.,
     1                 0.,      0.,      0.,   700.,  1700.,  3600.,
     2             11000., 13500.,  4500.,  2500.,  9000.,  5000.,
     3                 0.,      0.,      0.,      0.,      0.,      0.,
     4              6000., 15000.,  5200. /
      DATA RNUTL /     2.,      2.,      0.,      1.5,     1.4,     1.5,
     1                 0.,      0.,     1.7,       .2,      .2,      0.,
     2                .5,      .4,      .4,       0.,      0.,      .3,
     3               1.2,     1.2,      0.,       .9,      .8,     .85,
     4                 0.,      0.,     .87,     .006,    .006,      0.,
     5              .005,   .0045,    .004,       0.,      0.,   .0047 /
      DATA RRPS /  150.2, 140.1, 200.,    150.1, 150.2, 149.,
     1             88.5,  60.1,   0. /
      DATA RELOSS /  .03, .035, .025 /
      DATA RRPC / 53.4, 20.2, 10.8, 52.2, 19.9, 11.5 /
      DATA RELOSC /  .021, .022 /
      DATA RRPL /   50.1,  43.1, 112.6,      0.,      0.,      0.,
     1                0.,      0.,      0.,    39.2,   49.2, 113.8,
     2             57.1,   35.2, 307.5,    210.,    75.5, 112.1,
     3                0.,      0.,      0.,      0.,      0.,      0.,
```

```
     4                220.,  36.7, 112.4 /
      DATA PFLOSL /  .0005, .0006,    0.,    .004,  .005, .0045,
     1                   0.,    0.,  .015 /
      DATA PCCONS /  5.1, 6.2, 2.5, 5.2, 6.5, 2.6, 5.0, 6.1, 2.9 /
      DATA RPOP / 1000., 1500., 500. /
      DATA PCCONC /  3.8, 4.0,  4.1,  1.2,  2.4,  2.0 /
      DATA PCCONL / 1.5, 10.,  4.,  0.,  0.,  0.,  0.,  0.,
     1                .5,  1.,  5.,  3., 10.,  7.,  2.,  5.,  8.,
     2                0.,  0.,  0.,  0.,  0.,  0.,  5.,  7.,  8. /
      DATA RTAX / .15, .15, .15, .17, .17, .17, .1, .1, .1,
     1            .2, .2, .2, 0., 0., 0., 0., 0., 0., 0., 0., 0. /
      CALL SECOND(A)
      CALL AGACC
      CALLSECOND(B)
      ELTIME = B - A
      PRINT880,ELTIME
880   FORMAT(*1*E11.4)
      WRITE(2,890)
      WRITE(2,900) (J,J=1,7),(I,(YGA(I,J),J=1,7),I=1,3)
      WRITE(2,902) (J,J=1,7),(I,(VALAD(I,J),J=1,7),I=1,3)
      WRITE(2,905) (J,J=1,7),(I,(YC(I,J),J=1,7),I=1,3)
      WRITE(2,910) (J,J=1,7),(I,(PFT(I,J),J=1,7),I=1,3)
      WRITE(2,915) (J,J=1,7),(I,(PTAX(I,J),J=1,7),I=1,3)
      WRITE(2,920) (J,J=1,7),(I,(PFTN(I,J),J=1,7),I=1,3)
      WRITE(2,925) (I,(J,J=1,7),(K,(TEXPE(I,J,K),J=1,7),K=1,3),I=1,3)
      WRITE(2,930) (I,(J,J=1,7),(K,(PCNUT(I,J,K),J=1,7),K=1,4),I=1,3)
      WRITE(2,935) (I,(J,J=1,7),(K,(TNUT(I,J,K),J=1,7),K=1,4),I=1,3)
      WRITE(2,940) (I,(J,J=1,3),(PCONCS(I,J),J=1,3),I=1,3)
      WRITE(2,945) (I,(K,PCONCC(I,1,K),K=1,2),I=1,3)
      WRITE(2,950) (I,(J,J=1,3),(K,(PCONCL(I,J,K),J=1,3),K=1,3),I=1,3)
      WRITE(2,952)
      WRITE(2,955) (I,PYGA(I),PVALAD(I),PYC(I),I=1,3)
      WRITE(2,957) (I,PPFT(I),PPTAX(I),PPFTN(I),PEXPE(I),I=1,3)
      WRITE(2,960) (J,J=1,4),(I,(PPCNUT(I,J),J=1,4),I=1,3)
      WRITE(2,962) (J,J=1,4),(I,(PPCNUT(I,J),J=1,4),I=1,3)
      WRITE(2,965) (J,J=1,4),(I,(PTNUT(I,J),J=1,4),I=1,3)
      WRITE(2,967)
      WRITE(2,970) AYGA,AVALAD,AYC,APFT,APTAX,APFTN,AEXPE
      WRITE(2,975) (I,APCNUT(I),APCNUT(I),ATNUT(I),I=1,4)
      WRITE(2,980) (J,J=1,7),(AOUTS(J),J=1,3)
      WRITE(2,985) (K,AOUTCM(1,K),K=1,2)
      WRITE(2,990) (J,J=1,3),(K,(AOUTLM(J,K),J=1,3),K=1,3)
      STOP
890   FORMAT(1H1,20(1H-),31HENTERPRISE ACCOUNTING VARIABLES,20(1H-))
900   FORMAT(1H1,18X,35HGROSS INCOME FROM AGRICULTURE (YGA),
     +       /1H ,30X,10HENTERPRISE,/4H REG,I6,6I9,
     +       3(/1H ,I2,2X,7F9.0))
902   FORMAT(1H1,18X,37HVALUE ADDED IN AG ENTERPRISES (VALAD),
     +       /1H ,30X,10HENTERPRISE,/4H REG,I6,6I9,
     +       3(/1H ,I2,2X,7F9.0))
905   FORMAT(1H1,18X,40HTOTAL MONEY INCOME FROM AGRICULTURE (YC),
     +       /1H ,30X,10HENTERPRISE,/4H REG,I6,6I9,
     +       3(/1H ,I2,2X,7F9.0))
910   FORMAT(1H1,21X,29HPROFIT FROM AGRICULTURE (PFT),
     +       /1H ,30X,10HENTERPRISE,/4H REG,I6,6I9,
     +       3(/1H ,I2,2X,7F9.0))
915   FORMAT(1H1,15X,42HPRODUCER TAX ON AGRICULTURAL PROFIT (PTAX),
     +       /1H ,30X,10HENTERPRISE,/4H REG,I6,6I9,
     +       3(/1H ,I2,2X,7F9.0))
920   FORMAT(1H1,18X,36HPROFIT, NET OF PRODUCER TAXES (PFTN),
     +       /1H ,30X,10HENTERPRISE,/4H REG,I6,6I9,
```

```
     +        3(/1H ,I2,2X,7F9.0))
925   FORMAT(1H1,14X,42HEXPENDITURES ON AGRICULTURAL INPUTS (EXPE),
     +        3(/1H0,32X,6HREGION,I2/1H ,31X,10HENTERPRISE/
     +        5H PROD,I6,6I9,3(/1H ,I3,2X,7F9.0)))
930   FORMAT(1H1,17X,38HRURAL CONSUMPTION OF NUTRIENTS (RCNUT),
     +        3(/1H0,32X,6HREGION,I2/1H ,31X,10HENTERPRISE/
     +        4H NUT,I6,6I9,4(/1H ,I2,2X,7F9.0)))
935   FORMAT(1H1,21X,38HPRODUCTION OF NUTRIENTS (PNUT),
     +        3(/1H0,32X,6HREGION,I2/1H ,31X,10HENTERPRISE/
     +        4H NUT,I6,6I9,4(/1H ,I2,2X,7F9.0)))
940   FORMAT(1H1,8X,47HRURAL CONSUMPTION -- SINGLE-PRODUCT ENTERPRISES
     +        9H (RCONCS),3(/1H0,32X,6HREGION,I2/1H ,31X,10HENTERPRISE/
     +        21X,I7,2I9/22X,3F9.0))
945   FORMAT(1H1,5X,39HRURAL CONSUMPTION -- MULTI-PRODUCT CROP,
     +        21H ENTERPRISES (RCONCO),3(/1H0,32X,6HREGION,I2/1H ,31X,
     +        10HENTERPRISE/18X,10HPROD      1,2(/18X,I2,2X,F9.0)))
950   FORMAT(1H1,4X,45HRURAL CONSUMPTION -- MULTI-PRODUCT LIVESTOCK ,
     +        20HENTERPRISES (RCONCL),3(/1H0,32X,6HREGION,I2/1H ,31X,
     +        10HENTERPRISE/18X,4HPROD,I6,2I9,3(/18X,I2,2X,7F9.0)))
952   FORMAT(1H1,21(1H-),29HREGIONAL ACCOUNTING VARIABLES,21(1H-))
955   FORMAT(1H1,14X,12HGROSS INCOME,8X,11HVALUE ADDED,9X,
     +        12HMONEY INCOME/4H REG,13X,6H(RYGA),13X,8H(RVALAD),14X,
     +        6H(RYC),3(/1H ,I2,2X,3F20.0))
957   FORMAT(1H1,8X,6HPROFIT,7X,14HPRODUCER TAXES,4X,10HNET PROFIT,5X,
     +        12HEXPENDITURES/5H  REG,5X,6H(RPFT),11X,7H(RPTAX),9X,
     +        7H(RPFTN),9X,7H(REXPE),3(/1H ,I3,F14.0,3F16.0))
960   FORMAT(1H1,16X,39HRURAL CONSUMPTION OF NUTRIENTS (RRCNUT)/
     +        1H ,32X,8HNUTRIENT/14X,3HREG,I7,3I9,3(/14X,I2,2X,4F9.0))
962   FORMAT(1H1,11X,42HPER CAPITA RURAL CONSUMPTION OF NUTRIENTS ,
     +        8H(RPCNUT)/1H ,32X,8HNUTRIENT/14X,3HREG,I7,3I9,
     +        3(/14X,I2,2X,4F9.2))
965   FORMAT(1H1,21X,31HPRODUCTION OF NUTRIENTS (PTNUT)/1H ,32X,
     +        8HNUTRIENT/14X,3HREG,I7,3I9,3(/14X,I2,2X,4F9.0))
967   FORMAT(1H1,21(1H-),29HNATIONAL ACCOUNTING VARIABLES,21(1H-))
970   FORMAT(1H1,18X,24HGROSS INCOME (AYGA)      ,F12.0/
     +        19X,24HVALUE ADDED (AVALAD)     ,F12.0/
     +        19X,24HMONEY INCOME (AYC)       ,F12.0/
     +        19X,24HPROFIT (APFT)            ,F12.0/
     +        19X,24HPRODUCER TAXES (APTAX)   ,F12.0/
     +        19X,24HNET PROFIT (APFTN)       ,F12.0/
     +        19X,24HEXPENDITURES (AEXPE)     ,F12.0)
975   FORMAT(1H1,8X,79HRURAL CONSUMPTION       PER CAPITA RURAL,7X,
     +        10HPRODUCTION/11X,12HOF NUTRIENTS,10X,14HCONSUMPTION OF,
     +        7X,12HOF NUTRIENTS/4H NUT,8X,8H(APCNUT),10X,
     +        18HNUTRIENTS (APCNUT),7X,7H(ATNUT),4(/1H ,I2,F19.0,
     +        F21.2,F21.0))
980   FORMAT(1H1,9X,46HTOTAL PRODUCTION -- SINGLE-PRODUCT ENTERPRISES,
     +        8H (AOUTS)/1H ,31X,10HENTERPRISE/21X,I7,2I9/22X,3F9.1)
985   FORMAT(1H1,6X,33HTOTAL PRODUCTION -- MULTI-PRODUCT CROP ,
     +        20HENTERPRISES (AOUTCM)/1H ,31X,10HENTERPRISE/18X,4HPROD,
     +        5X,1H1,2(/18X,I2,3X,F9.1))
990   FORMAT(1H1,4X,44HTOTAL PRODUCTION -- MULTI-PRODUCT LIVESTOCK ,
     +        20HENTERPRISES (AOUTLM)/1H ,37X,10HENTERPRISE/18X,4HPROD,
     +        I7,2I9,3(/18X,I2,2X,3F9.1))
      END
```

2. Component

```
      SUBROUTINE AGACC
C
C     TITLE - AGRICULTURAL ACCOUNTING ROUTINE
C
C     VERSION - 1A
C
C     DATE - 1 JUNE 1975
C
C     PURPOSE - CALCULATION OF ACCOUNTING VARIABLES IN AN AGRICULTURAL
C               SIMULATION MODEL
C
C     INPUT REQUIREMENTS
C
C         VALUES TRANSMITTED THROUGH COMMON - ALL VARIABLES IN COMMON
C                   BLOCKS ACCOUN AND ACCIN
C
C         VARIABLES REQUIRING VALUES WHICH WILL NOT CHANGE DURING A RUN
C                   -- NCPROD, NENT, NINP, NLPROD, NMCENT, NMLENT,
C                   NNPINP, NNUT, NPTG, NSENT
C
C         VARIABLES REQUIRING VALUES WHICH MAY CHANGE DURING A RUN
C                   -- ALL OTHER INPUT VARIABLES
C
C     OUTPUT VARIABLES
C
C         VALUES TRANSMITTED THROUGH COMMON -- ALL VARIABLES IN COMMON
C                   BLOCKS ENTACC, REGACC, AND NATACC
C
C     VARIABLE DEFINITIONS
C
C         AEXPE - TOTAL AGRICULTURAL EXPENDITURE ON AGRICULTURAL INPUTS
C                 IN VALUE UNITS.
C
C         AOUTCM(J,K) - TOTAL OUTPUT OF MULTI-PRODUCT CROP ENTERPRISES
C                       FROM ALL REGIONS IN QUANTITY UNITS. (ENTERPRISE
C                       ,PRODUCT)
C
C         AOUTLM(J,K) - TOTAL OUTPUT OF MULTI-PRODUCT LIVESTOCK
C                       ENTERPRISES FROM ALL REGIONS IN QUANTITY UNITS.
C                       (ENTERPRISE,PRODUCT)
C         AOUTS(J) - TOTAL OUTPUT OF SINGLE-PRODUCT ENTERPRISES FROM
C                    ALL REGIONS IN QUANTITY UNITS. (ENTERPRISE)
C
C         APCNUT(L) - NATIONAL PER CAPITA RURAL CONSUMPTION OF NUTRI-
C                     ENTS OF DOMESTIC ORIGIN IN QUANTITY UNITS PER
C                     PERSON. (NUTRIENT)
C
C         APFT - PROFITS FROM AGRICULTURE IN VALUE UNITS.
C
C         APFTN - PROFITS FROM AGRICULTURE, NET OF PRODUCER LOSSES IN
C                 VALUE UNITS.
C
C         APTAX - PRODUCER TAXES ON AGRICULTURAL PROFITS IN VALUE UNITS
C
C         ARCNUT(L) - DOMESTICALLY PRODUCED NUTRIENTS CONSUMED BY THE
C                     RURAL POPULATION IN QUANTITY UNITS. (NUTRIENT)
C
C         ATNUT(L) - TOTAL AMOUNTS OF NUTRIENTS PRODUCED BY DOMESTIC
C                    AGRICULTURE IN QUANTITY UNITS. (NUTRIENT)
C
C         AVALAD - VALUE ADDED IN AGRICULTURE IN VALUE UNITS.
```

```
C
C       AYC - TOTAL MONEY INCOME FROM AGRICULTURE IN VALUE UNITS.
C
C       AYGA - GROSS INCOME FROM AGRICULTURE IN VALUE UNITS.
C
C       EXPE(I,J,N) - EXPENDITURES ON AGRICULTURAL INPUTS IN VALUE
C                     UNITS. (REGION,ENTERPRISE,INPUT)
C
C       LCON - LOGICAL VARIABLE INDICATING WHETHER CONSUMPTION WILL
C              BE CALCULATED.
C
C       LNUT - LOGICAL VARIABLE INDICATING WHETHER NUTRIENT VARIABLES
C              WILLBE CALCULATED.
C
C       LTAX - LOGICAL VARIABLE INDICATING WHETHER TAX VARIABLES WILL
C              BE CALCULATED.
C
C       NCPROD - NUMBER OF CROP PRODUCTS FROM MULTI-PRODUCT CROP
C                ENTERPRISES.
C
C       NENT - TOTAL NUMBER OF AGRICULTURAL ENTERPRISES.
C
C       NINP - NUMBER OF AGRICULTURAL INPUTS.
C
C       NLPROD - NUMBER OF LIVESTOCK PRODUCTS FROM MULTI-PRODUCT
C                LIVESTOCK ENTERPRISES.
C
C       NMCENT - NUMBER OF MULTI-PRODUCT CROP ENTERPRISES.
C
C       NMLENT - NUMBER OF MULTI-PRODUCT LIVESTOCK ENTERPRISES.
C
C       NNRINP - NUMBER OF AG INPUTS WHICH DO NOT RECEIVE WAGES,
C                PROFITS, RENTS, OR INTEREST.
C
C       NNUT - NUMBER OF NUTRIENTS.
C
C       NREG - NUMBER OF REGIONS.
C
C       NSENT - NUMBER OF SINGLE-PRODUCT ENTERPRISES.
C
C       OUTCM(I,J,K) - OUTPUT OF MULTI-PRODUCT CROP ENTERPRISES IN
C                      QUANTITY UNITS. (REGION,ENTERPRISE,PRODUCT)
C
C       OUTLM(I,J,K) - OUTPUT OF MULTI-PRODUCT LIVESTOCK ENTERPRISES
C                      IN QUANTITY UNITS. (REGION,ENTERPRISE,PRODUCT)
C
C       OUTS(I,J) - OUTPUT OF SINGLE-PRODUCT ENTERPRISES IN QUANTITY
C                   UNITS. (REGION,ENTERPRISE)
C
C       PCCONC(I,J,K) - RURAL PER CAPITA CONSUMPTION OF AG PRODUCTS
C                       FROM MULTI-PRODUCT CROP ENTERPRISES IN
C                       QUANTITY UNITS. (REGION,ENTERPRISE,PRODUCT)
C
C       PCCONL(I,J,K) - RURAL PER CAPITA CONSUMPTION OF AG PRODUCTS
C                       FROM MULTI-PRODUCT LIVESTOCK ENTERPRISES IN
C                       QUANTITY UNITS. (REGION,ENTERPRISE,PRODUCT)
C
C       PCCONS(I,J) - RURAL PER CAPITA CONSUMPTION OF AG PRODUCTS
C                     FROM SINGLE-PRODUCT ENTERPRISES IN QUANTITY
C                     UNITS. (REGION,ENTERPRISES)
C
```

```
C
C       PFLOSC(J,K) - FARM LOSS OF PRODUCTS FROM MULTI-PRODUCT CROP
C                     ENTERPRISES. PROPORTION. (ENTERPRISE,PRODUCT)
C
C       PFLOSL(J,K) - FARM LOSS OF PRODUCTS FROM MULTI-PRODUCT
C                     LIVESTOCK ENTERPRISES. PROPORTION. (ENTERPRISE,
C                     PRODUCT)
C
C       PFLOSS(J) - FARM LOSS OF PRODUCTS FROM SINGLE-PRODUCT
C                   ENTERPRISES. PROPORTION. (ENTERPRISE)
C
C       PFT(I,J) - PROFIT FROM AGRICULTURE IN VALUE UNITS. (REGION,
C                  ENTERPRISE)
C
C       PFTN(I,J) - PROFIT FROM AGRICULTURE, NET OF PRODUCER TAXES IN
C                   VALUE UNITS. (REGION,ENTERPRISE)
C
C       PRINP(I,N) - PRICES OF AGRICULTURAL INPUTS IN VALUE UNITS.
C                    (REGION,INPUT)
C
C       PRPC(I,J,K) - FARM PRICE OF PRODUCTS FROM MULTI-PRODUCT CROP
C                     ENTERPRISES IN VALUE UNITS. (REGION,ENTERPRISE,
C                     ENTERPRISES IN VALUE UNITS. (REGION,ENTERPRISE,
C                     PRODUCT)
C
C       PRPL(I,J,K) - FARM PRICE OF PRODUCTS FROM MULTI-PRODUCT
C                     LIVESTOCK ENTERPRISES IN VALUE UNITS. (REGION,
C                     ENTERPRISE,PRODUCT)
C
C       PRPS(I,J) - FARM PRICE OF PRODUCTS FROM SINGLE-PRODUCT
C                   ENTERPRISES IN VALUE UNITS. (REGION,ENTERPRISE)
C
C       PTAX(I,J) - PRODUCER TAX ON AGRICULTURAL PROFIT IN VALUE
C                   UNITS. (REGION,ENTERPRISE)
C
C       RCNUT(I,J,L) - NUTRIENTS CONSUMED BY THE RURAL POPULATION IN
C                      QUANTITY UNITS. (REGION,ENTERPRISE,NUTRIENT)
C
C       RCONCC(I,J,K) - RURAL CONSUMPTION OF PRODUCTS FROM MULTI-
C                       PRODUCT CROP ENTERPRISES IN QUANTITY UNITS.
C                       (REGION,ENTERPRISE,PRODUCT)
C
C       RCONCL(I,J,K) - RURAL CONSUMPTION OF PRODUCTS FROM MULTI-
C                       PRODUCT LIVESTOCK ENTERPRISES IN QUANTITY
C                       UNITS. (REGION,ENTERPRISE,PRODUCT)
C
C       RCONCS(I,J) - RURAL CONSUMPTION OF PRODUCTS FROM SINGLE-
C                     PRODUCT ENTERPRISES IN QUANTITY UNITS. (REGION,
C                     ENTERPRISE)
C
C       REXPE(I) - TOTAL REGIONAL EXPENDITURES ON AG INPUTS IN VALUE
C                  UNITS. (REGION)
C
C       RINP(I,J,N) - AGRICULTURAL INPUT REQUIREMENTS IN QUANTITY
C                     UNITS. (REGION,ENTERPRISE,INPUT)
C
C       RNUTC(J,K,L) - AMOUNT OF NUTRIENTS IN PRODUCTS FROM MULTI-
C                      PRODUCT CROP ENTERPRISES IN NUTRIENT UNITS PER
C                      PRODUCT UNIT. (ENTERPRISE,PRODUCT,NUTRIENT)
C
C       RNUTL(J,K,L) - AMOUNT OF NUTRIENTS IN PRODUCTS FROM MULTI-
C                      PRODUCT LIVESTOCK ENTERPRISES IN NUTRIENT
```

```
C                    UNITS PER PRODUCT UNIT. (ENTERPRISE,PRODUCT,
C                    NUTRIENT)
C
C         PNUTS(J,L) - AMOUNT OF NUTRIENTS IN PRODUCTS FROM SINGLE-
C                      PRODUCT ENTERPRISES IN NUTRIENT UNITS PER
C                      PRODUCT UNIT. (ENTERPRISE,NUTRIENT)
C
C         RPCNUT(I,L) - RURAL PER CAPITA NUTRIENT CONSUMPTION IN
C                       QUANTITY UNITS PER PERSON. (REGION,NUTRIENT)
C
C         RPFT(I) - PROFIT FROM AGRICULTURE IN VALUE UNITS. (REGION)
C
C         RPFTN(I) - PROFIT FROM AGRICULTURE, NET OF PRODUCER TAXES IN
C                    VALUE UNITS. (REGION)
C
C         RPOP(I) - RURAL POPULATION IN INDIVIDUALS. (REGION)
C
C         RPTAX(I) - PRODUCER TAXES ON AGRICULTURE IN VALUE UNITS.
C                    (REGION)
C
C         RRCNUT(I,L) - NUTRIENT CONSUMPTION BY RURAL POPULATION IN
C                       QUANTITY UNITS. (REGION,NUTRIENT)
C
C         RTAX(I,J) - PRODUCER PROFIT TAX RATE, PROPORTION. (REGION,
C                     ENTERPRISE)
C
C         RTNUT(I,L) - AMOUNT OF NUTRIENTS PRODUCED IN QUANTITY UNITS.
C                      (REGION,NUTRIENT)
C
C         RVALAD(I) - VALUE ADDED IN AGRICULTURE IN VALUE UNITS.
C                     (REGION)
C
C         RYC(I) - TOTAL MONEY INCOME FROM AGRICULTURE IN VALUE UNITS.
C                  (REGION)
C
C         RYGA(I) - GROSS INCOME FROM AGRICULTURE IN VALUE UNITS.
C                   (REGION)
C
C         TNEXP - INTERMEDIATE VARIABLE FOR CALCULATING VALAD.
C
C         TNUT(I,J,L) - AMOUNT OF NUTRIENTS PRODUCED IN QUANTITY UNITS.
C                       (REGION,ENTERPRISE,NUTRIENT)
C
C         TOTC - INTERMEDIATE VARIABLE FOR CALCULATING YC.
C
C         TOTEXP - INTERMEDIATE VARIABLE FOR CALCULATING PFT.
C
C         TOTG - INTERMEDIATE VALUE OF YGA.
C
C         TOTNUT - INTERMEDIATE VALUE OF TNUT.
C
C         TOTRCN - INTERMEDIATE VALUE OF RCNUT.
C
C         VALAD(I,J) - VALUE ADDED IN AGRICULTURE IN VALUE UNITS.
C                      (REGION,ENTERPRISE)
C
C         YC(I,J) - TOTAL MONEY INCOME FROM AGRICULTURE IN VALUE UNITS.
C                   (REGION,ENTERPRISE)
C
C         YGA(I,J) - GROSS INCOME FROM AGRICULTURE IN VALUE UNITS.
C                    (REGION,ENTERPRISE)
```

```
      COMMON /ACCOUN/ LCON, LNUT, LTAX, NCPROD, NENT, NINP, NLPROD,
     +                NMCENT, NMLENT, NNPINP, NNUT, NREG, NSENT
      COMMON /ACCIN/  OUTCM(3,1,2), OUTLM(3,3,3), OUTS(3,3),
     +                PCCONC(3,1,2), PCCONL(3,3,3), PCCONS(3,3),
     +                PELOSC(1,2), PELOSL(3,3), PELOSS(3), PRINP(3,3),
     +                PRPC(3,1,2), PRPL(3,3,3), PRPS(3,3),
     +                RINP(3,7,3), RNUTC(1,2,4), RNUTL(3,3,4),
     +                RNUTS(3,4), RPOP(3), RTAX(3,7)
      COMMON /ENTACC/ EXPE(3,7,3), PET(3,7), PETN(3,7), PTAX(3,7),
     +                RCNUT(3,7,4), RCONCC(3,1,2), RCONCL(3,3,3),
     +                RCONCS(3,3), TNUT(3,7,4),
     +                VALAD(3,7), YC(3,7), YGA(3,7)
      COMMON /REGACC/ REXPE(3), RRCNUT(3,4), RPET(3), RPETN(3),
     +                RPTAX(3), RRCNUT(3,4), RTNUT(3,4), RVALAD(3),
     +                RYC(3), RYGA(3)
      COMMON /NATACC/ AEXPE, AOUTCM(1,2), AOUTLM(3,3), AOUTS(3),
     +                ARCNUT(4), APET, APETN, APTAX, ARCNUT(4),
     +                ATNUT(4), AVALAD, AYC, AYGA
      LOGICAL LCON, LNUT, LTAX
C
C         SET ALL TOTALS TO ZERO PRIOR TO SUMMING
C
      TPOP = 0.
      AYGA = 0.
      AYC = 0.
      AEXPE = 0.
      AVALAD = 0.
      APET = 0.
      APTAX = 0.
      APETN = 0.
      DO 3 J=1,NSENT
          AOUTS(J) = 0.
3     CONTINUE
      DO 9 J=1,NMCENT
          DO 6 K=1,NCPROD
              AOUTCM(J,K) = 0.
6         CONTINUE
9     CONTINUE
      DO 15 J=1,NMLENT
          DO 12 K=1,NLPROD
              AOUTLM(J,K) = 0.
12        CONTINUE
15    CONTINUE
      IF(.NOT. LNUT) GO TO 30
      DO 20 L=1,NNUT
          ARCNUT(L) = 0.
          ATNUT(L) = 0.
20    CONTINUE
C     ************************
C     BEGINNING OF REGION LOOP
C     ************************
30    DO 700 I=1,NREG
          RYGA(I) = 0.
          RYC(I) = 0.
          REXPE(I) = 0.
          RVALAD(I) = 0.
          RPET(I) = 0.
          RPTAX(I) = 0.
          RPETN(I) = 0.
          IF(.NOT. LNUT) GO TO 50
          DO 40 L=1,NNUT
```

```
            RRCNUT(I,L) = 0.
            RTNUT(I,L) = 0.
40        CONTINUE
C         ==========================
C         BEGINNING OF ENTERPRISE LOOP
C         ==========================
50        DO 650 J=1,NENT
            IF(J .GT. NSENT) GO TO 150
C
C               SINGLE PRODUCT ENTERPRISES
C
            YGA(I,J) = PRPS(I,J)*OUTS(I,J)*(1.-PFLOSS(J))
            AOUTS(J) = AOUTS(J) + OUTS(I,J)
            IF(.NOT. LCON) GO TO 80
            RCONCS(I,J) = PCCONS(I,J)*PROP(I)
            GO TO 90
80          RCONCS(I,J) = 0.
90          YC(I,J) = YGA(I,J) - RCONCS(I,J)*PRPS(I,J)
            IF(.NOT. LNUT) GO TO 550
            DO 100 L=1,NNUT
                TNUT(I,J,L) = OUTS(I,J)*PNUTS(J,L)
                RCNUT(I,J,L) = RCONCS(I,J)*PNUTS(J,L)
                PRCNUT(I,L) = PRCNUT(I,L) + RCNUT(I,J,L)
                RTNUT(I,L) = RTNUT(I,L) + TNUT(I,J,L)
100         CONTINUE
            GO TO 550
150         IF(J .GT. NSENT+NMCENT) GO TO 350
C
C               MULTI-PRODUCT CROP ENTERPRISES
C
            TOTC = 0.
            TOTG = 0.
            JN = J - NSENT
            DO 200 K=1,NCPROD
                TOTG = TOTG + PRPC(I,JN,K)*OUTCM(I,JN,K)*
                       (1.-PFLOSC(JN,K))
                AOUTCM(JN,K) = AOUTCM(JN,K) + OUTCM(I,JN,K)
                IF(.NOT. LCON) GO TO 190
                RCONCC(I,JN,K) = PCCONC(I,JN,K)*PROP(I)
                TOTC = TOTC + RCONCC(I,JN,K)*PRPC(I,JN,K)
                GO TO 200
190             RCONCC(I,JN,K) = 0.
200         CONTINUE
            YGA(I,J) = TOTG
            YC(I,J) = TOTG - TOTC
            IF(.NOT. LNUT) GO TO 550
            DO 300 L=1,NNUT
                TOTNUT = 0.
                TOTRCN = 0.
                DO 250 K=1,NCPROD
                    TOTRCN = TOTRCN + RCONCC(I,JN,K)*PNUTC(JN,K,L)
                    TOTNUT = TOTNUT + OUTCM(I,JN,K)*PNUTC(JN,K,L)
250             CONTINUE
                RCNUT(I,J,L) = TOTRCN
                TNUT(I,J,L) = TOTNUT
                PRCNUT(I,L) = PRCNUT(I,L) + TOTRCN
                RTNUT(I,L) = RTNUT(I,L) + TOTNUT
300         CONTINUE
            GO TO 550
C
C               MULTI-PRODUCT LIVESTOCK ENTERPRISES
```

```
C
350         TOTC = 0.
            TOTG = 0.
            JN = J - NSENT - NMCENT
            DO 400 K=1,NLPROD
                TOTG = TOTG + PRPL(I,JN,K)*OUTLM(I,JN,K)*
                       (1.-PFLOSL(JN,K))
                AOUTLM(JN,K) = AOUTLM(JN,K) + OUTLM(I,JN,K)
                IF(.NOT. LCON) GO TO 390
                RCONCL(I,JN,K) = PCONCL(I,JN,K)*PROP(I)
                TOTC = TOTC + RCONCL(I,JN,K)*PRPL(I,JN,K)
                GO TO 400
390             RCONCL(I,JN,K) = 0.
400         CONTINUE
            YGA(I,J) = TOTG
            YC(I,J) = TOTG - TOTC
            IF(.NOT. LNUT) GO TO 550
            DO 500 L=1,NNUT
                TOTNUT = 0.
                TOTRCN = 0.
                DO 450 K=1,NLPROD
                    TOTRCN = TOTRCN + RCONCL(I,JN,K)*RNUTL(JN,K,L)
                    TOTNUT = TOTNUT + OUTLM(I,JN,K)*RNUTL(JN,K,L)
450             CONTINUE
                RCNUT(I,J,L) = TOTRCN
                TNUT(I,J,L) = TOTNUT
                RRCNUT(I,L) = RRCNUT(I,L) + TOTRCN
                RTNUT(I,L) = RTNUT(I,L) + TOTNUT
500         CONTINUE
C
C               ALL ENTERPRISES
C
550         TOTEXP = 0.
            TNEXP = 0.
            DO 600 N=1,NINP
                EXPE(I,J,N) = PINP(I,J,N)*PRINP(I,N)
                TOTEXP = TOTEXP + EXPE(I,J,N)
                IF(N .LE. NNPINP) TNEXP = TNEXP + EXPE(I,J,N)
600         CONTINUE
            VALAD(I,J) = YGA(I,J) - TNEXP
            PFT(I,J) = YC(I,J) - TOTEXP
            REXPE(I) = REXPE(I) + TOTEXP
            RVALAD(I) = RVALAD(I) + VALAD(I,J)
            RPFT(I) = RPFT(I) + PFT(I,J)
            RYGA(I) = RYGA(I) + YGA(I,J)
            RYC(I) = RYC(I) + YC(I,J)
            IF(.NOT. LTAX) GO TO 650
            PTAX(I,J) = PTAX(I,J)*PFT(I,J)
            IF(PTAX(I,J) .LT. 0.) PTAX(I,J) = 0.
            PFTN(I,J) = PFT(I,J) - PTAX(I,J)
            RPTAX(I) = RPTAX(I) + PTAX(I,J)
            RPFTN(I) = RPFTN(I) + PFTN(I,J)
650     CONTINUE
C       ======================
C       END OF ENTERPRISE LOOP
C       ======================
        AYGA = AYGA + RYGA(I)
        AYC = AYC + RYC(I)
        AEXPE = AEXPE + REXPE(I)
        AVALAD = AVALAD + RVALAD(I)
        APFT = APFT + RPFT(I)
```

```
              IF(.NOT. LTAX) GO TO 660
              APTAX = APTAX + RPTAX(I)
              APETN = APETN + RPETN(I)
660           IF(.NOT. LNUT) GO TO 700
              DO 680 L=1,NNUT
                  ATNUT(L) = ATNUT(L) + RTNUT(I,L)
                  ARCNUT(L) = ARCNUT(L) + RRCNUT(I,L)
                  RRCNUT(I,L) = RRCNUT(I,L)/RPOP(I)
680           CONTINUE
              TPOP = TPOP + RPOP(I)
700       CONTINUE
C         ******************
C         END OF REGION LOOP
C         ******************
          IF(.NOT. LNUT) GO TO 800
          DO 750 L=1,NNUT
              APCNUT(L) = APCNUT(L)/TPOP
750       CONTINUE
800       RETURN
          END
*EOR
*EOR
10.24.05..000013 PAGES PRINT. 000627 LINES PRINT. EOR @ 000.59 AT RG2.
```

CLASS Documents

Number	Title
1	"Computer Library for Agricultural Systems Simulation: A Progress Report," Michael H. Abkin and Tom W. Carroll. (July 1976)
2	"Software Standards Manual." (July 1976)
3	"Policy Analysis Language, Version 2.3, Programmer's Guide for CDC Cyber Computers," Claudia S. Winer and Chris Wolf. (July 1976)
4	"Policy Analysis Language, Version 2.3, Reference Manual," Claudia S. Winer anc Chris Wolf. (July 1976).
5	"Policy Analysis Language, Version 2.3, Guide to Using a PAL Program," Claudia S. Winer and Chris Wolf. (July 1976)
6	"DEMOGC: Demography with Distributed Age Cohorts," Michael H. Abkin and Chris Wolf. (July 1976)
7	"DEMOGD: Demography with Discrete Age Cohorts," Michael H. Abkin and Chris Wolf. (July 1976)
8	"Distributed Delay Routines: DEL, DELS, DELF, DELLF, DELVF, DELLVF," Michael H. Abkin and Chris Wolf. (July 1976)
9	"Table Functions: TABEL, TABEX, TABUL, TABUX," Michael H. Abkin, Chris Wolf, and Tom W. Carroll. (July 1976)
10	"AGACC: Accounting Routine for the Agricultural Sector," Dennis Pervis and Chris Wolf. (July 1976)
11	"User's Guide for the Beef Cattle Enterprise Simulation Model," Michael R. Jaske. (July 1976)
12	"User's Guide to SYSOPT: An Interactive System Optimization Computer Program," Marcus Buchner. (August 1976)