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Rubino R. (ed.), Morand-Fehr P. (ed.).
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Zaragoza : CIHEAM

Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 38

1999

pages 115-120

Article available on line / Article disponible en ligne à l'adresse :

<http://om.ciheam.org/article.php?IDPDF=99600145>

To cite this article / Pour citer cet article

De Vivo C. **Agricultural Accountancy and Production Costs: The INEA Software "Pegaso" for the Livestock Sector.** In : Rubino R. (ed.), Morand-Fehr P. (ed.). *Systems of sheep and goat production: Organization of husbandry and role of extension services* . Zaragoza : CIHEAM, 1999. p. 115-120 (Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 38)



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Agricultural accountancy and production costs: The INEA software "Pegaso" for the livestock sector

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SUMMARY - Pegaso is a software package created by the INEA (National Institute of Agricultural Economics) in 1993; its purpose is to increase the effectiveness of training and information activities with regard to agriculture and make an effective instrument of support available to agricultural workers for controlling management of the farm. The Pegaso package consists of five interfaced softwares and an installation program. The completed system, starting from the book-keeping data gathered according to the INEA method, processes the balance-sheet and proceeds to an analysis of the farm's efficiency, and draws up a development plan with the support of a file of production costs. The whole package covers three operational areas: survey and checking of accounts analysis of financial results; and identification of possible production alternatives. The software package Pegaso has been very favourably received in the area of technical assistance in Italy, suggesting that it responds to a real demand of the agricultural operators.

Key words: Pegaso, software, farm management.

RESUME - *"Comptabilité agricole et coûts de production : Le software "Pegaso" de l'INEA pour le secteur de l'élevage". Pegaso est un software créé par l'INEA (Institut National d'Economie Agricole) en 1993 ; son propos est d'augmenter l'efficacité des activités de formation et d'information dans le domaine de l'agriculture, et de mettre à disposition des agriculteurs un instrument effectif d'appui pour contrôler la gestion de l'exploitation. Le software Pegaso consiste en cinq logiciels possédant une interface entre eux plus un programme d'installation. Le système complet commence par les données de comptabilité recueillies selon la méthode INEA, et permet d'élaborer la feuille de bilan d'une part et de procéder à une analyse de l'efficacité de la ferme, et d'autre part de mettre au point un plan de développement avec l'appui d'un fichier des coûts de production. L'ensemble du software couvre trois domaines opérationnels : étude et vérification de la comptabilité ; analyse des résultats financiers ; identification des alternatives possibles de production. L'ensemble du software Pegaso a été accueilli très favorablement en tant qu'assistance technique dans toute la région italienne, ce qui permet de penser qu'il répond à une demande réelle des opérateurs agricoles.*

Mots-clés : Pegaso, Logiciel, gestion de l'exploitation.

Introduction

Pegaso, the acronym of "Programma di Economia e Gestione Aziendale per Strutture Operative" (Economical and farm Management Program for Operational Structures), is a package created by INEA (National Institute of Agricultural Economic) in 1993; its purpose is to increase the effectiveness of training and informational activities with regard to agriculture and make an effective instrument of support available to agricultural workers for controlling management of the farm.

It is well known that business management control is developed at different times and following a logical connection: gathering and systematic organization of the farm structural and management data; critical analysis of the results of the farm's management and structure and the consequent diagnosis of any inefficiency; selecting and planning the interventions aimed at removing such inefficiencies. Each of these steps calls for the use of appropriate methods, which are widely available now, thanks to the development of informatics over the last few years, which has favoured the spread of softwares aimed at operational simplification and rapidity of procedure. Yet the availability of such procedures, each one of them created to tackle a specific task in the field, has ended up by putting the users in difficulties because of the inevitable diversity, both as regards the purely informatics aspect and also from the point of view of methodology. This has not permitted a coordinated use of the same at the various moments when the farm required assistance.

By creating the Pegaso package, INEA has intended to offer a first, concrete contribution to the solution of these difficulties and to meet the operational needs of the management consultants and the farmers themselves[†].

A brief description of Pegaso softwares

The Pegaso package consists of five softwares interfaced with one another plus an installation program. In the most recent version, the space occupied on the disk is less than 20 Mb and the system can be installed in modules, program by program.

The completed system, starting from the book-keeping data gathered according to the INEA method, makes it possible to process the balance sheet on the one hand and to proceed to an analysis of the farm's efficiency, and on the other hand to draw up a development plan with the support of a file of production costs. The whole packet, as illustrated in diagram form in the flow chart, covers three areas of operation: survey of the accounts and checking of the same; analysis of financial results; identification of possible production alternatives.

The purpose of the package is to permit a wide-ranging use of the farm's book-keeping results and, therefore, it can interest a vast number of users: from agricultural entrepreneurs to the instructor of basic information, from the professional organization's technician to the civil servant.

The whole system consists of 5 items of software:

(i) *Continea*: is the agricultural book-keeping system based on the INEA method. A copy of the program makes it possible to keep the accounts of several businesses. It is possible, by means of Continea, to: register the book-keeping data; assign the CEE typology; activate a set of formal and specific checks; create a data-base of the data gathered and processed.

(ii) *Test 2*: reads the Continea files and makes it possible to compare the results of the various farms, in order to pick out and emphasize atypical data.

(iii) *Erica 1*: is an operation that analyses the business's management; the method adopted is the one that analyses efficiency by comparing homogeneous groups and by index chains. It utilizes the data-base created by Continea for this purpose.

(iv) *Processo*: withdraws from the Continea files the data on production (cultivation and breeding) gathered during the book-keeping operations and reconstructs the structure of production and costs of the same. It creates and implements a file of production processes and is endowed with the functions of interactive interrogation of the same.

(v) *Piano*: is a planning procedure for simulations based on the analytical budget method. It can transfer data from both Processo and Continea, but it can also be employed independently of the use of Continea.

Treatment of data relating to stock-farming in the Pegaso package and in Processo

Stock-farming on Continea

For all categories of live-stock, the program permits registration, as set out below, differentiated if necessary according to the farm's specialization, of: initial and final inventory data (number and value) of the animals owned; the number of animals not owned, at the beginning and end of the year; i.e., those animals bred or fattened on contract, or animals grazing on rented land; annual mean numbers of livestock (owned or not) on the farm during the financial year and ascertained through be-monthly checks; movements of live-stock owing to: births and deaths, buying and selling, taken for

[†]A revision plan of the whole package is being studied, which should lead to a new version of Pegaso using Windows interface by 1999.

consumption by the farmer or as wages in kind. The program automatically calculates, on the basis of the recorded data, the complete tally of animals, and the gross profits of the herds or flocks as well as the gross margin on the farm's breeding operations; the farm's products, including stored stock.

When the user's objective is to make full use of Pegaso's potentiality for analysing management, production processes and for planning, then the means of data gathering need to be more profound. Besides the direct management of the "Cassa e Deposito" account (cash and deposit), the integrated data-gathering is particularly concerned with data on the activities of production, with regard to which, with reference to stock-farming, it will always be necessary to gather the following data: quantities of technical means employed: feed, fodder (e.g., hay), bedding, fuel (for central heating systems); the number of man/hours employed in the process, subdivided according to category of labour; the number of machine/hours employed in the process.

The Continea program permits a balance-sheet to be drawn up, with the specific aim of evaluating the overall economic-financial management of the farm. The analysis starts with the structural characteristics and goes on to analyse the economic-profit ones, paying particular attention to the financial situation. The balance-sheet, obviously, also analyses the breeding on the particular farm as far as technical parameters are concerned.

Temporal comparisons of the same farm in different years are possible in order to evaluate the results, as well as spatial comparisons between different farms for the same operation.

Stock-farming on Piano

The Piano program, starting from the farm's initial situation, permits the development of alternative hypotheses for improvement in the management, by means of a series of simulation. As far as the stock-breeding are concerned, after having identified the objective to be pursued, the first information needed for drawing up a draft plan for improvement, relates to the number of animals to be raised and the degree of self-sufficiency expected. Once these parameters have been fixed, the program processes the data with the establishment of the final size of the herd or flock.

Stock-farming on Processo

The book-keeping method adopted by INEA does not make it possible to carry out an in-depth financial analysis of the farm's productive operations beyond the limit of the so-called Gross Margin, since some costs are aggregated.

When the objective desired by the user is to exploit the potential of Pegaso to the full, for analysis of management, production processes and for planning, then the method of gathering data needs to be more thorough. Besides direct management of the "Cassa e Deposito" account, integrated data-gathering is particularly concerned with data on the activities of production, with regard to which, with reference to stock-farming, it will always be necessary to gather the following data: quantities of technical means employed: feed, fodder (e.g., hay), bedding, fuel (for central heating systems); the number of man/hours employed in the process, subdivided according to category of labour; the number of machine/hours employed in the process.

Using Processo is possible: to determinate the structure of the production, costs and profits, as well as the use of productive factors of operations for the production of crops and animals, gathered by the agricultural book-keeping software Continea; supply the user with the functions of processing, visualization and printing of the contents of the files thus produced, on the basis of pre-determined models (technical-economic charts), or by interactive means, according to selection determined by the user according to the variables available.

Thus we are dealing with a tool that may be used not only by an individual farm as support for management analysis and planning, but also within the wider framework of agricultural education.

The functions of Processo are divided into two main branches: one relates to the creation of files and the other concerns management of the same.

Three files are produced: (i) gross margins (only for crops); (ii) crop production processes; and (iii) animal production processes.

The results of a stock-farm are presented below.

Output of the technical-economic chart of stock-farms (dairy sheep-breeding farm)

(i) Production and costs

YEAR:	FARM:		(value in 000Lit.)				
Region:	Province:	Zone alt.:	Farm type:	Econ. Size:			
Breed:	No. of animals:		No. U.B.A.:				
Description	S.U.	Quantity	Price	Value	Lire per UBA	T.O.	Total

Production

1. Main product: milk
 - 1.1. Amount to be processed
2. Processed/product: cheese
3. Other processed products
4. By-products: wool
5. U.L.S.
6. Integration on products
7. Integration on animals
8. Total output (T.O.)

Variable costs

9. Bought feed
10. Re-used feed
11. Bought fodder
12. Re-used fodder
13. Bought bedding
14. Re-used bedding
15. Re-used milk
16. Health and veterinary fees
17. Hire debits
18. Processing, conservation, sales
19. Temporary labour
20. Use of farm machinery
21. Sundry costs
22. Total variable costs
23. Gross income (8-22)

Fixed costs

24. Household social security payments
25. Permanent labour (hourly)
26. Farm machinery depreciation
27. Other farm machinery
28. Buildings depreciation
29. Rent debits
30. General expenses, property, tax
31. Total fixed costs
32. Net income (23-31)

Calculated fixed costs

- 33. Interest on capital in real estate owned
- 34. Interest on working capital
- 35. Total calculated fixed costs
- 36. Total cost (TC)
- 37. Household labour remuneration (hourly)

(ii) Average stock, movements and gross return on flock

Description	No. animals	Descr	Inventory Balance	Births	Deaths	Purchase	Sales
Sheep Other ovine animals							
		000 £					
U.L.S. (Inventory Balance + Sales – Purchase)							

Processo can "read" and process the book-keeping data of many farms in only a few seconds; this makes it possible to construct wide-ranging files of production processes rapidly, which are immediately comparable, offering great advantages both as regards evaluation of the efficient management of single farms and also as regards interpretation of the economic trend of the various production processes over a period of time in different areas, farm typology, etc. However, Processo does not analyse the technology (nor can it do so, considering the data source) of the production process.

Conclusions

The software package Pegaso has been very favourably received in the ground of technical assistance in the whole Italian region, suggesting that it answers to a real demand of the agricultural operators.

The specificity of such a package, which constitutes also its originality, is given by the possibility of using the same information basis, that is the accounting data from the software Continea, in order to perform every analysis required from the other programs included in Pegaso.

That means that it is possible to import from Continea, with the appropriate filter options, the data necessary for the company efficiency analysis within a group of homogeneous companies, in order to implement plans of performance improving and to analyse the productive processes.

Such a procedure allows the technician to work in the best way and to offer an assistance service examining the different aspects of the company conduction.

Pegaso, then, has been widely tested, not only in lectures or research contexts, but in the ordinary work among the technicians used to supply consulting services to companies.

That kind of operators constitutes the target of Pegaso, being the knowledge of the agricultural companies and the geographical ground in which they act, one of the 'must' in order to rationally utilize the package. A rational use of Pegaso implies that the data from the single company are

referred to the right context, allowing an objective interpretation of productive, economic and financial results.

The software Pegaso, useless to say, could be improved in the functional ground as well as the methodological one.

The experience until now has been quite interesting in this sense and INEA will be very glad to receive indications and suggestions in the near future.

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