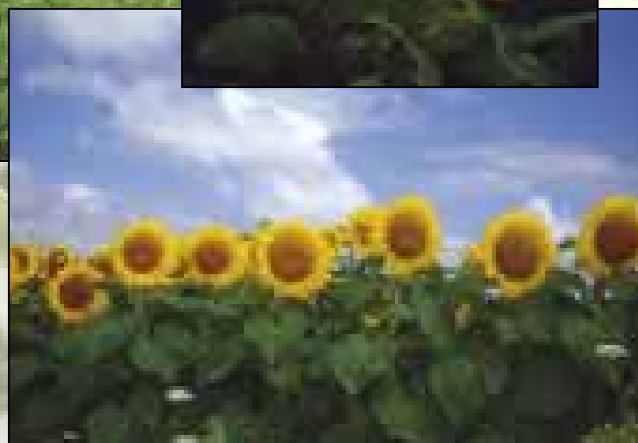


Fertilizer use by crop in Argentina



Fertilizer use by crop in Argentina

**Land and Plant Nutrition Management Service
Land and Water Development Division**

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 2004**

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Fertilizer use by crop in Argentina

First version, published by FAO, Rome, 2004

Food and Agriculture Organization of the United Nations

Viale delle Terme di Caracalla

00100 Rome, Italy

Tel.: +(39) 06 57051

Fax: +(39) 06 57053360

E-mail: land-and-water@fao.org

Web site: www.fao.org

All rights reserved. Reproduction and dissemination of material in this information product for educational or other non-commercial purposes are authorized without any prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material in this information product for resale or other commercial purposes is prohibited without written permission of the copyright holders. Applications for such permission should be addressed to the Chief, Publishing Management Service, Information Division, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy or by e-mail to copyright@fao.org

© FAO 2004

Contents

ACKNOWLEDGEMENTS	vi
ABSTRACT	vii
ABBREVIATIONS AND SYMBOLS	viii
PREFACE	ix
1. AGRO-ECOLOGICAL REGIONS	1
The Pampa and the economic regions	1
Pampa	1
Northern region	1
Irrigated valleys	2
Soils	3
2. AGRICULTURAL PRODUCTION	5
Levels of technology	5
Changes in the profile of producers	6
Level of education	6
Place of residence	7
Access to technical assistance	7
Land ownership	7
Production by region	8
Pampa	8
The economic regions	9
3. FERTILIZERS USED AND THEIR SUPPLY	11
Production and trade	11
Products	12
Forms of fertilizers	13
Bulk	13
Mixtures	14
Liquid fertilizers	14
4. FERTILIZER CONSUMPTION	15
5. USE OF FERTILIZERS BY CROP AND REGION	17
Pampa	18
Cereals	20

Economic regions	22
Industrial crops	22
Tobacco	23
Cotton	23
Sugar cane	23
Fruit crops	24
Yerba mate	25
Vines	24
Tea	25
Rice	25
Beans	25
Horticultural crops	26
6. ECONOMICS	27
Grain and fertilizer prices	27
Financing of purchases	27
7. MANURE AS A SOURCE OF NUTRIENTS	29
8. FERTILIZER DISTRIBUTION	31
Importers, merchants, wholesalers and producers	31
Merchants (Acopiadores)	32
Retailers	32
Seasonality	32
Services	32
Regulations	33
Costs of importation, trade and distribution	33
9. PRODUCER ASSOCIATIONS	35
Cooperatives	35
Sowing pools	35
10. RESEARCH AND EXTENSION	37
11. CONSTRAINTS AND OUTLOOK	39
BIBLIOGRAPHY	43

List of figures

1.	Agro-ecological regions in Argentina	2
2.	Dominant soil map of Argentina	4
3.	Development of direct seeding for the principal crops	9
4.	Development of pressure irrigation	10
5.	Use of blends and bulk fertilizers, 1998 to 2000	14
6.	Imports and production of fertilizers in Argentina	16
7.	Prices of the main grain crops, 1996 to 2002	16
8.	Fertilization of the principal crops in the Pampa region	19
9.	Response of wheat in relation to soil analyses, SE Buenos Aires	21

List of tables

1.	Areas, number of producers and production according to the technical level	5
2.	Differences in yield at different technical levels	6
3.	Pampa: Farmer-owned and rented land	7
4.	Number and average area of farms in the Pampa region	8
5.	Development of the fertilizer sector since 1960	11
6.	Fertilizer production and trade	12
7.	Sown area, proportion fertilized and average rates, 2002/03	17
8.	Fertilizer consumption, 2002/03	18
9.	Pampa. Average rates of application of urea, DAP and blends	19
10.	Percentage of farmers using fertilizers on different Pampa's crops	20
11.	Non-Pampa regions: Fertilizer consumption, 2002/03	22
12.	Relationships between grain and fertilizer prices	28
13.	Estimated consumption of manure in horticultural fruit production	29
14.	Main cost items for imported fertilizers	34

Acknowledgements

This study is based on the work of Ricardo J. Melgar, Instituto Nacional de Tecnología Agropecuaria (INTA) Fertilizar.

The study benefited from the contributions of K. Isherwood, J. Poulisse and T. van den Bergen (FAO).

The background cover photograph is from the FAO Mediabase (FAO/8766/E. Kennedy) and the other photographs were provided by R.J. Melgar.

Abstract

After decades of stagnation, the agricultural sector in Argentina responded during the first half of the 1990s to the removal of high levies on agricultural exports. At the same time customs duties on mineral fertilizers were greatly reduced. By the mid-1990s maize production had tripled, soybean production had doubled and wheat production had increased by 50 percent. Since then, wheat and maize production have stabilized but soybean production has continued to climb.

Argentina is best known historically as a cattle-raising country, on the Pampa, and even in 1960 Argentina still accounted for a third of the world's exports of beef and veal. Today almost all the meat is consumed domestically but Argentina is now the world's third largest exporter of soybeans, the third largest exporter of maize and the fourth largest exporter of wheat. Soybean exports have increased almost three-fold since 1990.

The level of crop production that prevailed until 1990 did not need much fertilization, especially given the extensive areas of rich soils, but the large increase of grain production in the first half of the 1990s required a substantial increase. Fertilizer consumption rose five-fold between 1990 and 1996, from 165 000 tonnes of nutrients to 855 000 tonnes in 1996. Since then fertilizer consumption has stabilized. The main increase in crop production has been in soybeans, a crop that does not require heavy fertilization.

This study explains the reasons for these developments. It provides information on the different agricultural regions in Argentina and their resources. The changes in recent years in the profiles of the agricultural producers and the productivity of different groups according to the level of technology they have adopted are described. During the 1990s, two important technical innovations in the Pampa region were the sowing of herbicide resistant varieties of soybeans and direct sowing.

Wholesalers and retailers are increasingly offering farm services, including the offer of fertilizers in bulk and blends. A nationwide system for agricultural education, research and the communication of information has facilitated the transmission of new technologies.

The proportions fertilized of the main crops are now near their ceilings but there is some scope for increases in rates of fertilizer use. Soybeans and, to a lesser extent, sunflowers are likely to account for most of the increase in the arable acreage. These are crops that are not heavy consumers of fertilizers.

Abbreviations and symbols

AACREA	Asociación Argentina de Consorcios Regionales de Experimentación Agropecuaria.
AAPRESID	Asociación Argentina de Productores de Siembra Directa
ACA	Asociación de Cooperativas Argentinas
CIF	Carriage, Insurance and Freight
C&F	Carriage and Freight
CONICET	Consejo Nacional de Investigaciones Científicas y Técnicas
FAO	Food and Agriculture Organization of the United Nations
FET	Fondo Especial del Tabaco
f.o.b.	free on board
ha	hectare
IFA	International Fertilizer Industry Association
INDEC	Instituto Nacional de Estadística y Censos
INTA	Instituto Nacional de Tecnología Agropecuaria
MERCOSUR	Mercado Común del Sur
NEA	Nordeste de Argentina
NOA	Noroeste de Argentina
SAGyP	Secretaría de Agricultura, Ganadería y Pesca
SENASA	Servicio Nacional de Seguridad Agroalimentaria
tpa	tonnes per annum
UNDP	United Nations Development Programme
AN:	Ammonium nitrate
AS:	Ammonium sulphate
DAP:	Diammonium phosphate
MAP:	Monoammonium phosphate
UAN:	Urea ammonium phosphate solution
NS:	Solutions containing nitrogen and sulphur
NP:	Suspensions containing nitrogen and phosphate
TSP:	Triple superphosphate
N:	Nitrogen
P ₂ O ₅ or P:	Phosphate*
K ₂ O or K:	Potash*

* Phosphate and potash may be expressed as their elemental forms P and K or as their oxide forms P₂O₅ and K₂O. Nitrogen is expressed as N. In this study phosphate and potash are expressed in their oxide forms.

Preface

This study, commissioned by the Food and Agriculture Organization of the United Nations (FAO), is one of a series of publications on fertilizer use on crops in different countries.

The aim of the series is to examine the agro-ecological conditions, the structure of farming, cropping patterns, the availability and use of mineral and organic plant nutrients, the economics of fertilizers, research and advisory requirements and other factors that have led to present fertilizer usage. The publications examine, country by country, the factors that will or should determine the future development of plant nutrition.

During the past two decades, increasing attention has been paid to the adverse environmental impact of both the under use and the over use of plant nutrients. The efficient use of plant nutrients, whether from mineral fertilizers or from other sources, involves the shared responsibility of many segments of society, including international organizations, governments, the fertilizer industry, agricultural research and advisory bodies, traders and farmers. The publications in the series are addressed to all these parties.

Fertilizer use is not an end in itself. Rather it is a means of achieving increased food and fiber production. Increased agricultural production and food availability can, in turn, be seen as an objective for the agricultural sector in the context of contributing to the broader macroeconomic objectives of society. A review of the options available to policy makers is given in the FAO/IFA (International Fertilizer Industry Association) 1999 publication entitled “*Fertilizer Strategies*”.

The contents of the series of studies differ considerably from country to country, in view of their different structures, histories and food situation. But in each case the aim is to arrive at a better understanding of the nutrition of crops in the country concerned.