JAOCS News Feature

# The spectacular growth of the Brazilian soybean crop[1]

*The 1971-72 soybean crop is estimated at 3.4 million metric tons; the 1972-73 level should be well over 4 million tons and could be as high as 4.6 million tons. The new minimum support price of 30 cruzeiros per bag (60 kg) is 21% above last year support level. But the actual price is now 36 cruzeiros per bag (1 U.S.$ = 6 cruzeiros). Exports are estimated as of the end of July at 628,563 metric tons – soybeans, 21,559 tons of oil, 217,454 tons of cake. We expect bean and cake exports to reach the million ton market or more for this marketing year and next. Domestic consumption of oil and cake continues to grow, but at a fairly low rate when compared with the export growth rate. The government is stimulating production by ample credit and good support prices. A campaign in Rio Grande do Sul pushes for a production level of 3 million metric tons in 1972-73. Total production level for the country is forecast at 7 million tons by 1976-77.,*

## Area and production

The Brazilian Ministry of Agriculture estimates the area of soybeans harvested at 2.3 million hectares, with a production of 3.4 million metric tons. This is an area increase of 27% when compared with the previous year's area harvest. Yields in Rio Grande do Sul were as high as the year before, but yields in Paraná were spectacular. Most people in the ministry as well as the trade believe that this high yield will not be repeated in 1972-73 and are looking for more moderate levels. However the area to be planted in Paraná is expected to increase 50% over 1971-72. In Rio Grande do Sul the state government is conducting a campaign to increase production from the 2 million ton level of this year to 3 million next year; we believe that production will be 2.45 million metric tons. This would include the production of Santa Catarina. São Paulo should increase some, possibly to 300,000 metric tons. Santa Catarina could produce 150,000 metric tons and Minas, Mato Grosso and Goiás, 120,000 metric tons. Outside of Rio Grande do Sul it is believed that total production next year will be between 4 and 4.2 million metric tons. The most informed sources state that by 1976-77 Brazilian soybean production should be 7 million metric tons.

Soybean production in 1972-73 could go higher than this stated figure, since it is unlikely that the area sown to wheat and corn will increase. On the contrary, it might decrease. If this happens, that area planted in Rio Grande do Sul will be greater than we now anticipate and production could be as much as 2.6 million metric tons in 1972-73, with the production for Rio Grande do Sul and Santa Catarina reaching 2.75 million metric tons (Table I).

## Imports and exports

See trade figures for exports of soybeans, soy flour, refined and unrefined oil as well as soybean cake (Table II).

Table IV shows estimated trade and domestic consumption. See Tables III and IV for official and unofficial trade. Of course it is an estimate, but we believe it should give a good idea of the disposition of the crop.

## Consumption

It is calculated that total fats and oils consumption in 1972 will be 564,000 metric tons, rising to 605,000 metric tons in 1973 and 690,000 metric tons by 1975.

Two plants are presently under construction at Ponta Grossa, Paraná. One will be completed by the end of the year. The other, by the middle of next year. In this region alone total plant capacity will increase by 1,000,000 metric tons. This should make total capacity for soybeans over 3,300,000 metric tons in São Paulo, Paraná, Rio Grande do Sul.

Mills in São Paulo and Paraná crush cotton, peanuts and some castor as well. As a result, total capacity is of course much more than the figure stated above. The other two crops are harvested early in the calendar year, so that there is no difficulty crushing soybeans for the next 6 months. Total capacity could be well over 7 million tons.

The mills in Rio Grande do Sul crush only soybeans and work 330 days per year; their daily crushing rate this year has been 6500 metric tons. Their current crushing capacity is about 10,000 metric tons per day.

## Stocks

*Beans:* In order to obtain sufficient

TABLE I

Area[a] and Production,[b] 1970-73

| State | Area, 1000 hectares | | | Production, 1000 metric tons | | |
|---|---|---|---|---|---|---|
| | 1970-71 | 1971-72 | 1972-73 | 1970-71 | 1971-72 | 1972-73 |
| Rio Grande do Sul | 1150.6 | 1510.6 | 1700 | 1400 | 2060 | 2300 |
| Paraná | 325. 7 | 519.8 | 730 | 543 | 930 | 1300 |
| São Paulo | 99.8 | 147.5 | 180 | 30 | 220 | 300 |
| Santa Catarina | 28.1 | 80.1 | 110 | 30 | 100 | 150 |
| Minas Gerais, Goiás, Mato Grosso | 28.1 | 56.2 | 70 | 27 | 90 | 120 |
| Total | 1632.3 | 2314.0 | 2840 | 2080 | 3400 | 4170 |

[a]Not Ministry of Agriculture figures. Basic agreement in production but not area harvested.

[b]Office estimate.

[1]This information was received from Roberto F. Kohlmann, *JAOCS* Four Corners Corresponding Secretary from Brazil.

beans to operate mills in Rio Grande do Sul, the mills purchase an 11 month supply, depending upon size of the mill. This is done as the crop begins to come in; this operation continues so that by the end of the buying season each mill has a carry-over of about a 6 month supply. In São Paulo/Paraná (Goiás, Minas Gerais), since other oil seeds are crushed, stocks are bought for a total of only 6 months. Crushing for export shipment is done as soon as physically possible, so as not to have high carrying or storage charges. Therefore at the end of the year stocks are at a minimum.

TABLE II

Brazilian Exports, January-May 1972[a]

| Commodity | Metric tons |
|---|---|
| Soy seeds | |
| West Germany | 34,176 |
| East Germany | 16,000 |
| Belgium-Luxembourg | 6,087 |
| Spain | 38,878 |
| Italy | 44,404 |
| Netherlands | 18,487 |
| United Kingdom | 1,200 |
| Total | 159,232 |
| Unrefined soy oil | |
| Panama | 1,500 |
| Refined soy oil | |
| Chile | 894 |
| Iran | 7,000 |
| Panama | 2,500 |
| Paraguay | 10 |
| Peru | 6,000 |
| Uruguay | 3,033 |
| Total | 19,437 |
| Soybean extractions | |
| West Germany | 91,752 |
| East Germany | 5,248 |
| Argentina | 4,359 |
| Belgium-Luxembourg | 7,743 |
| Bulgaria | 17,798 |
| Denmark | 1,000 |
| France | 4,700 |
| Hungary | 17,852 |
| Ireland | 498 |
| Italy | 84,012 |
| Netherlands | 53,018 |
| Poland | 39,039 |
| Portugal | 9,754 |
| Rumania | 2,948 |
| Singapore | 996 |
| South Africa Republic | 297 |
| Czechoslovakia | 904 |
| Total | 341,919 |

[a]Source: Foreign Trade Department, Bank of Brazil (CACEX).

*Oil:* Brazil is now a surplus producer of soybean oil. As a result, ca. 20% of the oil produced will be exported. Except for local consumption requirements, all oils are put into export channels as soon as possible.

*Cake and meal:* Meal and oil are produced simultaneously, and the local buyers purchase cake immediately to go into concentrates (animal feed). Oil of course goes into exports and local consumption. About 70% of the meal is exported, flowing out steadily month by month.

## Supply and distribution

Assuming that all stocks of beans were in private hands, no official stocks were carried over at the end of the crop year 1971-72. Production was ca. 3.4 million metric tons. Of this amount, 267,600 metric tons is estimated for seed, feed, losses, etc. Total export of beans is forecast at 1 million tons. If exports are less than this level, then by that amount stocks will be available at the end of the current crop year.

The amount of beans available for crushing is estimated at 2.07 million tons, producing 1.53 million tons of meal and 373,032 tons of oil. The rest would be waste and losses. Of these amounts, exports of cake and meal should be over 1 million tons, while oil exports could reach 100,000 metric tons. We assume the rest would be consumed locally with a minimum of stocks.

## Prices

The current minimum price of 30 cruzeiros per 60 kilo bag of beans was approved by the government on July 14. This is 21% above the level of the previous year. However prices as of September 1 were running at the following levels at mills in Rio Grande do Sul: 36 cruzeiros per bag F.O.B., 40 cruzeiros São Paulo and 36 cruzeiros Paraná.

Meal prices in January were $100/ton F.O.B., and on September 1 were $119/ton, the same as in July. Oil prices were 110 cruzeiros per case of 29 kilos compared to 98 cruzeiros three months earlier. Oil F.O.B. Paranaguá was $236/ton the end of August. The consensus in this country is that only the U.S. and Brazil produce commercially significant quantities of beans in the world, with world demand increasing 10% per year; Brazil and the U.S. can continue to expand without doing harm to each other's international markets.

TABLE III

Brazilian Exports, January-July 1972[a]

| Commodity | Port | Metric tons |
|---|---|---|
| Soybeans | Paranaguá | 150,529 |
| | Porto Alegre | 135,215 |
| | Rio Grande | 188,615 |
| | Santos | 154,204 |
| | Total | 628,563 |
| Soybean oil | Porto Alegre | 8,360 |
| | Rio Grande | 13,199 |
| | Total | 21,559 |
| Soybean extractions | Porto Alegre | 86,228 |
| | Rio Grande | 119,314 |
| | Santos | 5,690 |
| | Paranaguá | 6,222 |
| | Total | 217,454 |

[a]Source: Soc. Brasileira de Superintendéncia Ltd.

## Policies that aid or affect soybeans

It is definitely policy, through good minimum prices and credit, to stimulate further growth of soybean production in Brazil. The internal prices are above the minimum levels, but even if prices fell to that level, the producers would still find soybeans an excellent crop in terms of returns. Crushers claim that they make no money exporting oil, but that cake exports are very good business; with beans they make small margins, depending upon the time of the year and volume of sale.

In Rio Grande do Sul, the State

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TABLE IV

Supply and Distribution, 1971-72 (metric tons)[a]

| Commodity | RGS[b] | | PR/SP[c] |
|---|---|---|---|
| Beans | | | |
| Production | 2,150,000 | | 1,190,000 |
| Seed, mill | 172,400 | | 95,200 |
| | 1,977,600 | | 1,094,800 |
| Exports | | | |
| End of August | 350,000 | | 220,000 |
| End of October | 400,000 | | 30,000 |
| Total | 750,000 | | 250,000 |
| Domestic use | 1,227,600 | | 844,800 |
| Meal (74% beans, domestic use) | | | |
| Crushed | | 1,533,576 | |
| Exports | | 1,100,000 | |
| Domestic use | | 433,576 | |
| Oil (18% beans, domestic use) | | | |
| Production | | 373,032 | |
| Exports | | 100,000 | |
| Domestic consumption | | 273,032 | |

[a]Source: Trade does not exactly correspond to Ministry estimate.
[b]Includes Santa Catarina, Rio Grande do Sul.
[c]Includes Minas Gerais, Mato Grosso and Goiás, Paraná and São Paulo.

# New Books

## J. F. Gerecht, Book Review Editor

*Surface and Colloid Science,* Vol. 5, Edited by Egon Matijevic (Wiley-Interscience Publishers, 1972, viii + 331 p., $22.50).

The fifth volume of this invaluable series, edited by Egon Matijevic, contains four chapters by three authors. These consist of two chapters (77 and 115 p., respectively) on surface rheology by M. Joly of the Institut Pasteur; a chapter on the physical chemistry of detergency (50 p.) by Anthony M. Schwartz, of the Gillette Co. Research Institute; and one by D. Tabor, University of Cambridge, on friction, lubrication and wear (68 p.).

Joly's first chapter is devoted to the basic concepts of surface rheology and an examination of the experimental methods available for the study of this property. The author erects a mathematical structure in which surface rheology is considered as a two dimensional analog of the three dimensional case. This is accomplished with truly remarkable thoroughness. However the use of tensor notation, with all its conciseness, will create an intellectual hazard for many readers. To be sure Joly does summarize the properties and significance of tensors, but it is doubtful that four pages, however clear, will suffice for the neophyte.

The second part of this first chapter describes the various techniques that have been used for the measurement of surface rheological properties and carefully subjects them to mathematical analysis. This permits an understanding of the advantages and deficiencies of the various methods. Although I may be reading more into this section than the author intended, I am left with the feeling that the deficiencies outweigh the advantages.

Professor Joly's second chapter begins with an extensive review of the quantitative data in the literature, reporting, where available, the compressional modulus, shear and dilational viscosity and the viscoelastic properties of large numbers of materials. The second half of this chapter turns to the theoretical interpretation of these results in terms of molecular structure, orientation and interaction.

Unfortunately, through no fault of the author, this section is somewhat uneven, simply because of the imperfections of theory or data, or both. Thus the section that would be of most interest to JAOCS readers, "The Stability of Emulsions, Bubbles and Foams," is extremely inconclusive. For example, it has been impossible to demonstrate unequivocally that surface (interfacial viscosity) has any effect whatever on the stability of emulsions, and, although the surface viscosity has been related to the stability of single lamellae (via the film drainage transition temperature), it has yet to be demonstrated that this has any major significance for the stability of bulk foams.

Although this review appears in 1972, there are few references later than 1965 and none later than 1967. As a result, the valuable experimental studies of Mannheimer (save for a reference to a paper delivered at a 1965 American Chemical Society Meeting) and the theoretical analyses of Goodrich are not included.

It would be hard to imagine a more suitable choice for a review of the physical chemistry of detergency than Tony Schwartz, and his chapter is not disappointing. It contains a careful definition of detergency, a discussion of model systems for the study of detergency, a review of the mechanism of soil removal, the dynamics and kinetics of soil removal and a brief review of recent studies of detergency.

One complaint about this contribution is that the discussion is almost wholly qualitative. Thus, although numerous surface-chemical relationships are introduced, they are used only to indicate trends. This, indeed, may accurately reflect the state of the art, and this chapter should then serve as an incentive to further investigation.

The final contribution is by another acknowledged authority, D. Tabor of the Surface Physics Department, Cavendish Laboratory. It serves as a most satisfactory introduction to the subject of friction, lubrication and wear. With this as background, it should be possible to dig deeper into this most important area of surface science, in which the properties of surface active agents play no small part.

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Department of Agriculture has a campaign, "3 milhoes toneladas para 73." There are posters everywhere and agronomists of the department are actually behind this program. Most people outside of the state, however, doubt that there will be a 50% increase in 1973.

[Received October 20, 1972]