

Soya beans: oil strike!

Demand for soya is surging ahead, and with more profit in value addition than in the growing of the crop, farmers should consider jumping onto the value adding train, **Louis Lagrange** told **Robyn Joubert**.

It may look mundane, but soya is no ordinary food. With a protein content of 35% to 40% and an oil content of 17% to 20%, the soya bean contains more protein than any other legume or cereal, and is second only to the groundnut for oil content. It also contains 35% carbohydrates.

This remarkable legume also produces an astonishingly high quantity of protein per area of land.

Small wonder, perhaps, that the "golden bean" has gained a reputation for being nature's miracle protein source and a potent weapon against world hunger.

"Global soya bean production has increased by over 500% in the last 40 years, reaching nearly 102 million hectares with total production at 251 million tons in 2009," says Louis Lagrange, senior lecturer at the School of Bioresources Engineering and Environmental Hydrology

at the University of KwaZulu-Natal.

"As the *per capita* income of countries increases, the demand for oilseed-based protein, consisting mainly of soya, increases, pulling production demand higher," he says.

China is currently the biggest importer of soya, accounting for 55% to 60% of world trade. The increase in Chinese demand for vegetable oil and protein meal is expected to boost demand from 50 million tons in 2009 to 80 million tons by 2020, increasing that country's market share of world oilseed meal to 23%. Increased oilseed meal demand is also predicted for most other countries, with Europe, the US and Brazil following China.

"Soya is the main oilseed crop in the world, and has grown at a continuous rate of 3,5% a year for the past 10 years," says Louis.

BELOW: Henry Davies of Soy South Africa shows how to make soya milk with a small-scale mobile soya processing unit, during a demonstration day sponsored by the Protein Research Foundation in the KZN Midlands in January 2011. PHOTOS: LOUIS LAGRANGE



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LOUIS LAGRANGE

"Global demand for oilseed protein meal is forecast to increase to 348 million tons in 2020, from about 250 million tons in 2010/11. Global meal demand will increase 43% for the next decade. At the same time, world protein meal stocks are declining, from an end stock of 4,5% in 1998 to 2,8% in 2010. This is a clear indication that international buffer stocks cannot absorb the increase in oilseed demand."

The top three soya-producing nations are the US (31,56 million hectares and 91 million tons); Brazil (23,5 million hectares and 65 million tons); and Argentina (18 million hectares and 50 million tons). China produces 14,6 million tons on 8,6 million hectares, India 8,8 million tons on 9 million hectares, Paraguay 6,5 million tons on 2,75 million hectares and Canada 3,9 million tons on 1,5 million hectares. These top seven countries account for 95% of global soya bean production, Louis says.

South Africa has a tiny 0,2% slice of this global protein pie. Yet the area under soya bean production and the total crop have both been increasing steadily. According to the Crop Estimates Committee, the country produced 710 000t of soya off 418 000ha in 2010/11.

The Bureau for Food and Agricultural Policy (BFAP) projects that by 2020, about 605 000ha of soya could yield 1,62 million tons. Soya expansion in South Africa is likely to be driven by

increasing demand from the livestock and poultry sectors, which are, in turn, expected to experience greater volumes as rising incomes boost demand for animal protein.

GLOBAL TRENDS FOR PROCESSED SOYA

"Approximately 85% of the world's soya bean crop is processed into soya meal and vegetable oil, with 98% of the meal used in livestock feed and 2% for human consumption. About 6% of soya beans are presently utilised for direct human consumption," says Louis.

Yet he sees ample opportunities in processing soya foods for the human food market.

Traditional products include soya milk, tofu, yuba, sauce and natto. A wide array of second-generation animal soya foods is also produced, including ice cream, yoghurt, fermented soya milk, fermented soya yoghurt and cheese or meat substitutes. Various oil-based products include soya bean oil, salad oils, cooking oil, shortening and margarine.

While soya milk does not yet have broad appeal to consumers in Middle Eastern and African markets, global soya milk sales earn over US\$15 billion (R121 billion) annually and the market is expanding. "In the US, 600 soya milk products earned US\$1,1 billion (R8,9 billion)

in 2009, with total sales of all soya products amounting to US\$4 billion (R32,3 billion). In Europe, sales of soya milk products earned €600 million (R6,5 billion) and in Asia, soya milk sales have been growing at a rate of 10% per annum to generate US\$1 billion (R8,1 billion) in 2007," says Louis.

Two factors are driving the demand for processed soya products: a health benefit and a protein requirement.

"Soya offers high and complete protein content – it's high in essential amino acids, but low in cholesterol and saturated fats," Louis points out. "When it comes to the protein requirement, barriers to using soya are flatulence due to oligosaccharides not being digestible and abdominal

discomfort in human and other monogastric animals. Another challenge is the relatively unfamiliar taste, especially in Africa.

However, processing breaks down soluble soya carbohydrates and removes flatus activity, increases ingestion properties and removes most of the 'beany' flavour.

'THE SA MARKET FOR HUMAN SOYA PRODUCTS SHOULD FOLLOW EUROPEAN TRENDS.'

The way forward for human consumption of soya products is thus through processing."

Louis expects that South African farmers will be quick to explore soya bean processing opportunities.

"It is expected that the South African market for human soya products will follow European trends over the last decade. We can expect to see soya ice cream, yoghurt, cheese, burgers and meat alternatives in the future," he says.

"There are already farmers in South Africa who press soya beans into oil and defatted soya meal for livestock feed. Some large manufacturers are importing their soya meal due to some inconsistencies in the protein content of the locally available meal. With better processing quality control, local suppliers could penetrate this soy meal market."

The process of refining defatted soya meal is more challenging and requires improved processing

quality control. However, Louis points out that there is now a local supplier of double-screw extruders, increasing the opportunity to refine defatted meal into texturised vegetable protein and soya flour. This will also allow for the manufacturing of pet food.

As an added incentive to plant soya, there is a significant correlation between the increasing price of petroleum and that of soya.

"This implies that the food versus fuel debate is real. Soya prices are following petroleum prices much more closely than in the past. This could lead to volatility in soya prices," says Louis.

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