

Biodiesel plans a solution for

Brazil's powerful soya crushing industry is one of the strongest supporters of the government's plan to add 10% vegetable oil to the 37 million tonnes of diesel fuel used by the country's truck and bus fleets.

By Patrick Knight

The ambitious Brazilian "biodiesel" programme is to be introduced during the next ten years. Two million tonnes of extra vegetable oil will be needed in 2005 for the first phase of the biodiesel programme, which aims to reduce imports of diesel fuel which now cost about \$300 million a year, and to reduce pollution, particularly in towns. Brazilian made diesel has a very high sulphur content.

Close to 60 million tonnes of soybeans will be harvested in Brazil this year, twice as much as six years ago. There is enough spare land in the "Cerrado", or savannah land of the Centre West and North East for up to three times as much again to be grown, should the demand exist. So the soya industry has put itself forward as the most suitable candidate to provide all the vegetable oil that will be needed next year, when it is planned to add up to 3% vegetable oil to diesel.

Crushing capacity decreased

Only about 600 litres of soya oil can be produced from a hectare of land, compared with up to 5,000 litres of palm oil, and much more groundnut, maize, and castor. So the case for soya looks relatively weak at first sight. But because 95% of the vegetable oil produced in Brazil is now soya, the crushers say that oil from this plant is the only realistic alternative.

It is the only crop of which enough extra could be grown to meet demand, at least in the short term, claim the crushers. In fact, the main reason for the soya industry's enthusiasm for biodiesel is rather different. Almost three times as many soybeans will be harvested in Brazil this year as in 1996, when 23 million tonnes were grown. But in the same period, the amount crushed has only increased from 16 million tonnes, to about 25 million tonnes. Back in 1995, there was enough capacity in Brazil to crush 120,000 tonnes a day, and almost three quarters of the soya left the country in the form of meal or oil.

But last year, more than half of the soya exported from Brazil was beans. The crushing capacity actually fell in the late 1990's, touching 108,000 tonnes a day in 2001. It has only started to rise again in the



Brazil's stagnant soybean crushing industry has high hopes for the use of soybean oil in biodiesel that can be used in busses such as this one in the US. (Photo: ARS, Keith Weller)

stagnant crushing industry

past couple of years, to stand at about 115,000 tonnes/day at the moment.

The reason for the fall was that because the government was anxious to encourage farmers to plant more soya, and for more to be exported, export taxes on all commodities were scrapped in 1996 in a move, which still remains controversial. Previous to this, beans destined for export had to pay a tax of about 12%, which is still the case in Argentina, while no export taxes were levied on either meal or oil. The idea was that it made little difference to farmers whether what they produced was processed or not. What they were interested in was what they were paid for their beans, and how easily they could be sold.

The fact, that output has increased so much since 1996, shows that the tactic of cutting taxes has worked well. Many countries, notably China, have themselves built large new crushing plants, and no longer import much meal or oil, but are anxious to buy more beans. Export earnings by the soya complex have grown from \$3.8 billion in 1995, to more than \$8 billion last year. Earnings are set to exceed \$11 billion this year.

Bordering differences

Brazil's crushers look longingly at the situation in neighbouring Argentina, where beans for export continue to be taxed, but where meal and oil is not. In contrast to what happens in Brazil, virtually all of the beans grown in Argentina are crushed, as very little soya meal or oil is used there.

But although the Brazilian crushers are upset that the industry is treated very differently in Argentina, the soya business has a very different profile from the Brazilian one as well. Soya is a relative newcomer to Argentina, and only started to be planted in a big way in the late 1980's. But it has been around in Brazil since the late 1960's, when the crop was first planted in the southernmost states of Rio Grande do Sul and Parana.

Varieties of beans, which are planted in the US, did well in Southern Brazil. Although in the early years,

they did not do so well in the centre of the country, where days are shorter and the climate a good deal hotter and wetter. New varieties, which do well in the Centre West of the country, have been developed in the past few years. These produce some of the world's highest yields, exceeding two tonnes per hectare.

Argentina has the advantage, however, that most of the soya planted there is grown on farms only about 350 km from ports, which are concentrated along the River Parana, where the beans are crushed. Brazil's soya is mostly grown up to 2,500 km from ports, so transport costs are high.

Argentine crushing plants are mostly far larger than those in Brazil, many of which were built in the 1970's and 1980's. Lower transport costs, and the fact plants are so much larger, means it costs about \$10 less to crush a tonne of beans into meal and oil in Argentina, than in Brazil.

Industry development

If the amount crushed has grown much more slowly than had been anticipated, the industry has not stood still in the past eight years. In the early 1980's, most of Brazil's crushing capacity was concentrated in the three states in the south of the country where the great majority of the crop was grown at that time. But several mills in the South have been closed down in the past few years. The smallest ones have been scrapped; others have been dismantled and taken to the Centre West, or more recently to the North East and North, where virtually the entire extra 25 million tonnes soya, which has been produced in the past few years, has been planted.

There is now sufficient capacity in the Centre West to crush 32,000 tonnes per day, compared with only 6,000 tonnes/day a decade ago. New mills have also been built in states such as Bahia and Piaui, where soya was virtually unknown a decade ago. One has been moved to Amazonia, a region from which about three million tonnes of soya is now exported each year. The average size of mills has increased as well. The share of the crush handled at mills able to process up to 600 tonnes a day has fallen from 9% of

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the total in the mid 1990's, to 6% now, a reduction of 4,000 tonnes. Plants able to crush more than 3,000 tonnes a day now have sufficient capacity to handle 23,000 tonnes a day, compared with the 9,000 tonnes/day they were able to process in 1998.

Cargill is now completing a plant, which will be able to process 5,000 tonnes a day, while several of the other crushers active in Brazil, which include Bunge and Born, ADM and Dreyfus, as well as local companies Caramaru and Maggi, are also adding capacity at existing mills.

Farmers breaking crusher ties

For many years, farmers were loaned much of the money they needed to plant and harvest soya from the oilseed crushers, who undertook to buy all the beans a farmer produced. They paid him partly in cash, partly in inputs such as fertilisers, which most of the crushers themselves make in Brazil, or arrange to import. By this means, farmers were tied to a single crusher, who could more or less dictate when beans would be harvested, and what price would be paid for them. But the soaring soya prices of the past four or five years have allowed farmers growing soya in Brazil to make profits of at least 50% of their production costs, and this has allowed many farmers to break free of the crushers tight embrace.

Many farmers now prefer to hold onto a proportion of their crop until late in the season, rather than as soon as it is harvested, although a severe shortage of storage limits this. Prices have been considerably higher very early in the year, than during, or immediately after the harvest, which takes place between February and April, at least in the past few years. This has occurred partly because crops in the US have been much smaller than expected for several consecutive years. Until a few years ago, most of Brazil's soya was crushed during the five or six months following the harvest, and mills stood idle for the rest of the year.

In the mid 1990's this meant that only about 50% of Brazil's total installed capacity was utilised. Beans are available virtually all the year round, as some is now grown on irrigated land during the winter months. Most mills now halt for maintenance only for a week or two, and the crushers try to ensure that some of their plants are always operating. Some crushers are planning to halt their mills only once every 18 months, as mills are currently operating at about 85% of their capacity, which is close to the limit.

Table - Production, exports, crush, and domestic consumption in millions of tonnes

Year	Production	Beans	Crush exports	Meal exports	Meal consumption
1996	23.2	3.9	15.9	11.2	5.2
1997	26.2	8.3	14.6	10.0	5.4
1998	31.4	9.3	16.6	10.4	5.9
1999	30.8	8.9	16.5	10.4	6.3
2000	32.3	11.5	15.8	9.4	6.8
2001	38.4	15.7	17.5	10.8	7.2
2002	41.9	16.0	20.1	12.8	7.6
2003	51.6	20.5	22.0	14.1	8.0
2004	59.0	25.2	24.5	16.4	8.3 (est)

Source: Association of Brazilian Oilseed Crushers, Above.

This helps push up margins, of course, so is welcome all round. Farmers who hold onto their beans will only get their fingers burnt if the US suddenly had a bumper crop, causing the soya price to collapse in the off season, or if China suddenly ceased to buy more each year. But with demand continuing to grow faster than supply at the moment, and with world stocks falling to dangerously low levels, this looks unlikely to happen for some time yet.

Brazil's crushing industry has been saved from a worse fate by the fact that large quantities of meal and oil are used in Brazil itself each year. Close to half of the five to six million tonnes of oil refined in Brazil is used there for cooking purposes, as soya oil is by far the most popular produce, mainly because it is relatively cheap.

Expanding meat industry

Brazil is the world's second largest chicken producer, of which well over eight million tonnes will be produced this year, as well as 2.5 million tonnes of pork. The dairy industry has also expanded quickly in the past few years and fish farming is growing fast as well. The result is that more than eight million tonnes of soya meal is now needed for feed purposes in Brazil each year.

The crushers in all of the four countries producing soya in South America, that is to say Brazil, Argentina, Paraguay and Bolivia, have all agreed that in theory, their tax regimes for soya should eventually be harmonised, so as to level the playing field. But whether that will mean that export taxes are reintroduced in Brazil, or eliminated in Argentina and other countries, remains to be seen. ●