# WORLD OUTLOOK AND FUTURE DEVELOPMENT OF SUNFLOWER MARKETS AROUND THE WORLD

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**Abstract**

World sunflower production has been declining in terms of total world oilseed and oil production. Sunflower yields have also declined progressively since 1993. This is likely due to the relocation of production to lower yielding regions. The world demand for protein meal has been very strong during this period. Soybean and palm oil have enjoyed the greatest growth over the last ten years. Palm oil dominated vegetable oil production during the 1993 to 2003 time frame with an increase of 101 percent. Throughout much of the 1980s and early 1990s, several countries purchased either sunflower seed or sunflower oil on the world market through government purchasing agencies. Often times, these agencies were willing to pay premiums over world market prices for sunflower oil/seed creating an artificial market price. Sunflower producers are not well suited for producing the cheapest oil when competing against the huge volumes of inexpensive soybean and palm oil. Some sunflower producing countries have been developing sunflower with altered fatty acids with the goal of gaining more market value. A key for some countries will be to find value niches in the market place that will pay a premium over most other vegetable oils, and thus provide a better return to the farmer.

## Introduction

World sunflower seed production increased by 24 percent or 5 million tons between 1993 and 2003 (Figure 1). However, sunflower seed production declined in terms of world market share of the five major oilseeds during that time frame (Figure 2). In 1994, world sunflower seed production represented just under 10 percent of the total world production of the five major oilseeds. In 2003 sunflower seed production represented 8.4 percent of the world total. Meanwhile, the soybean share of the total world production of the five oilseeds increased from 55 percent in 1993 to 61 percent in 2003.

The same situation exists for world production of six major vegetable oils. Of the combined world production of six vegetable oils, the sunflower oil share declined from 13 percent in 1993 to 10 percent in 2003 (Figure 3).

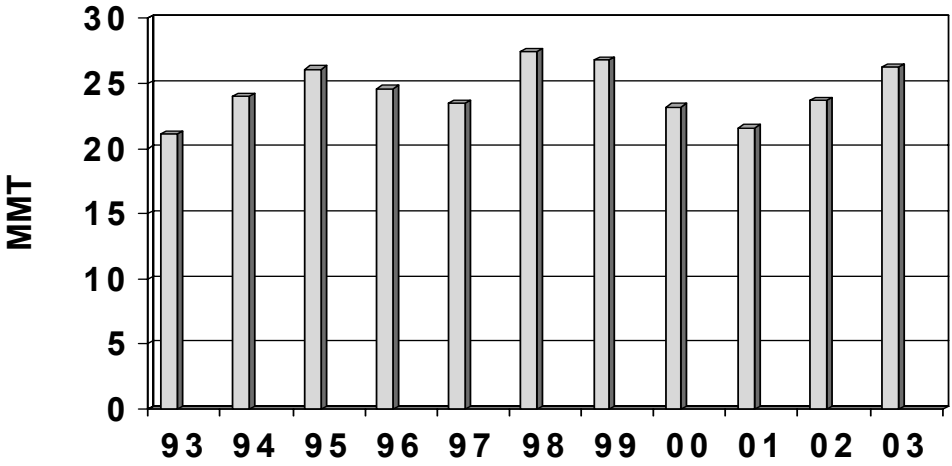


Figure 1. World sunflower seed production from 1993 through 2003.

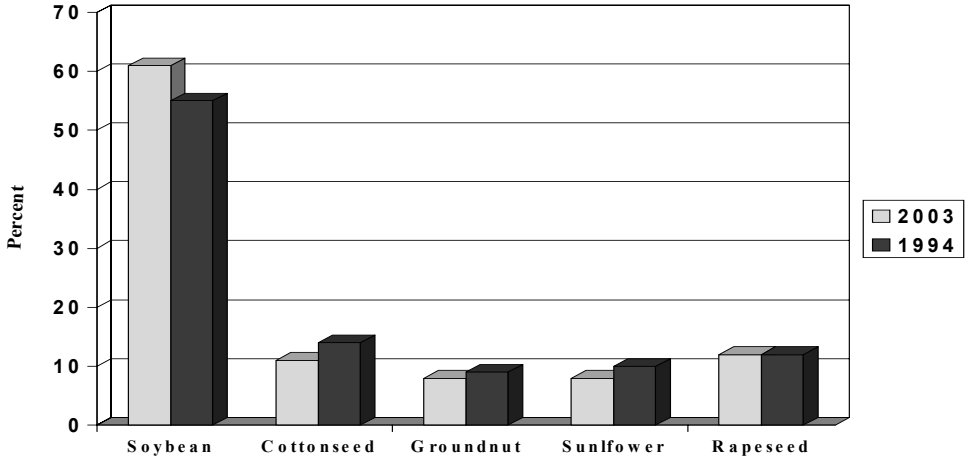


Figure 2. World oilseed production in 2003 compared to 1994.

The share of soybean oil increased from 31 percent to 35 percent during that same time frame. Palm oil production showed the largest increase with 24 percent in 1993 rising to 30 percent in 2003 of the world total of six major vegetable oils.

Sunflower harvested area has increased nearly 4 million hectares between 1994 and 2003, an increase of 22 percent. But there has been a noticeable shift in acreage. The following countries showed significant declines in harvested acres when comparing a three year average of 1994-96 to 2001-03: France, 29 percent reduction; Argentina, 31 percent reduction; and the USA, 22 percent reduction (Figure 4). Acreage has increased in the Black Sea area as

well as in China. Russian and Ukrainian sunflower area represented 13 percent of the world's harvested sunflower area in the 1994-96 time period (Figure 5). That increased to 17 percent in the 2001-03 time frame. It is interesting to note that world average sunflower yields actually declined between 1993 and 2003. The 1993-95 average world sunflower yield was 1.21 metric tons/hectare compared to 1.17 metric tons/hectare in the 2001-03 average (Figure 6). This is likely due to the relocation of production to lower yielding regions.

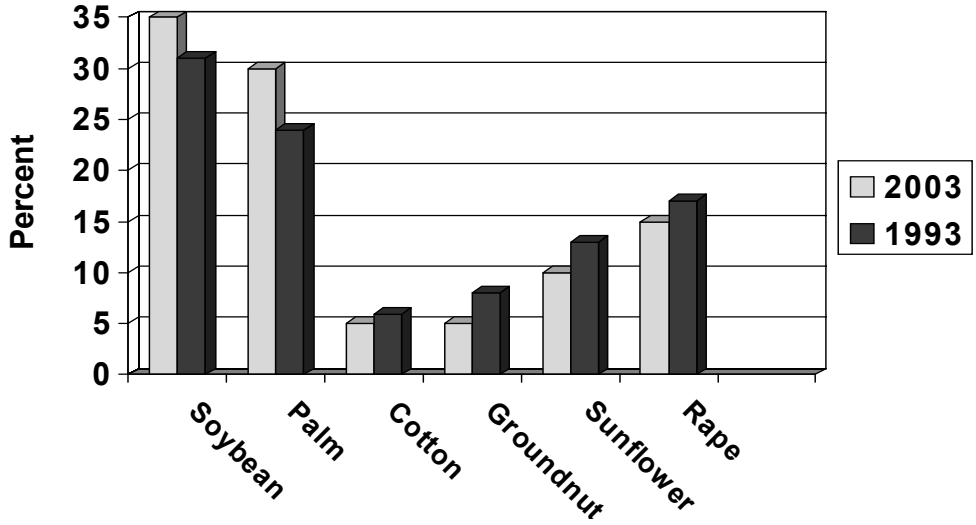


Figure 3. World oil production in 1993 compared to 2003.

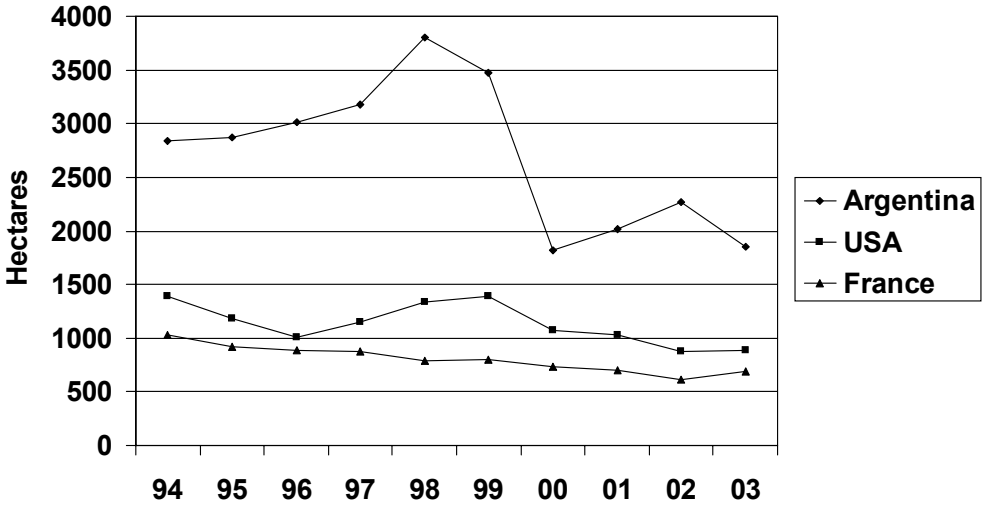


Figure 4. Harvested sunflower area in Argentina, USA, and France from 1994 through 2003.

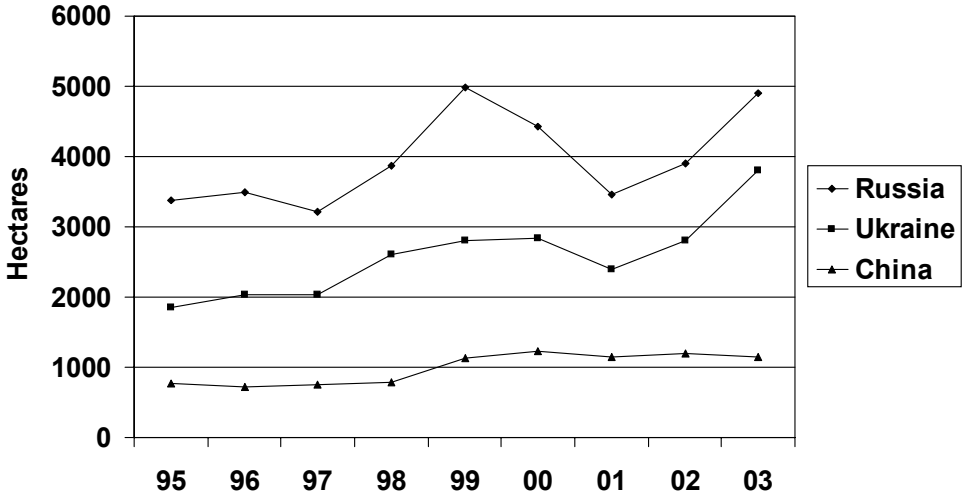


Figure 5. Harvested sunflower area in Russia, Ukraine, and China from 1995 through 2003.

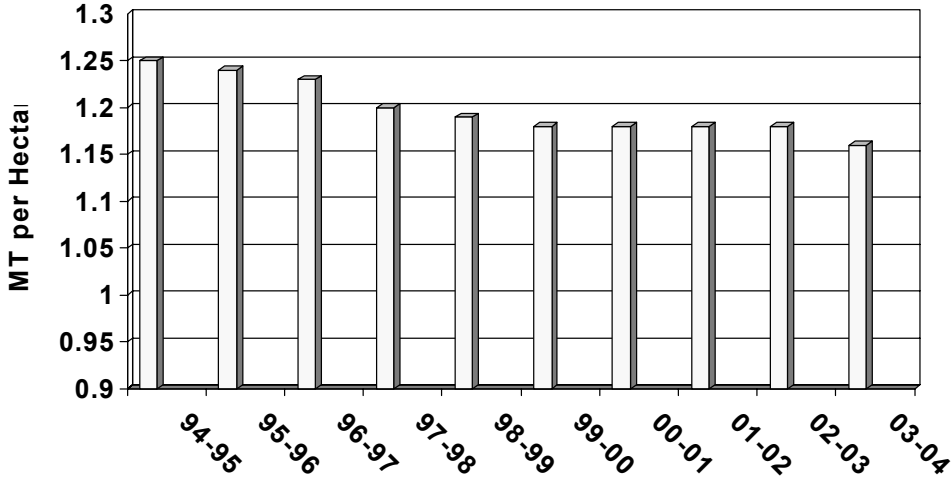


Figure 6. World average sunflower yields from 1994-1995 to 2003-2004.

**Discussion**

Why has the sunflower portion of world oilseed production declined in the last 10 years? There are several things that one can point to for this decline. The world demand for protein meal has been very strong during this period. Soybean meal disappearance increased 72 percent between 1993 and 2003, while disappearance of six major vegetable oils increased by 61 percent. This is a disadvantage to crops like sunflower which are heavily dependent on oil values to support the farmer price and thereby the incentive to plant the crop. Palm oil dominated vegetable oil production during the 1993 to 2003 time frame with an increase of 101 percent. That production, without a protein by-product, kept world oil values in check to the detriment of high oil content seeds like sunflower.

Another factor was the introduction of genetically modified soybean and canola crops in North and South America. The acceptance of Roundup Ready® crops in the Americas has been dramatic. The ease of weed control in Roundup Ready soybeans allows farmers to cover more acres with less capital input of equipment and labor. Progress in developing soybean varieties with shorter maturities has been important as well. During this time frame, China developed a huge appetite for imported soybeans and sent world soybean prices to near record levels. The combination of price and production innovations resulted in US soybeans moving further west and north in areas that had only limited history in growing soybeans. The same occurred in Argentina with production moving west and south. These were formerly sunflower production regions. Soybeans pushed sunflower into less desirable production regions in both the US and Argentina.

The sizeable sunflower planting decline in France may be due primarily to European Union (EU) farm policy and a trade agreement in what has become known as the Blair House Agreement. The Blair House Agreement established limits on EU oilseed acres and EU agriculture policy later equalized per hectare payments between oilseeds and grains. This further prompted a disincentive to plant oilseeds in the EU. Rapeseed in the EU actually increased in acreage during this time frame, largely because of the biodiesel provision in the Blair House Agreement allowing for rape to be planted on set aside acres for this industrial purpose.

On the growth side is China and the area commonly called the Black Sea region. Chinese sunflower production has increased by 50 percent between 1993 and 2003. According to *Oil World*, China produced 1,800,000 MT in 2003, but crushed only 815,000 MT. The large remainder of the crop is assumed to be consumed as a snack or food ingredient. Chinese sunflower seed exports are small but growing in importance as a food ingredient in parts of Western Europe.

The Black Sea region, principally Russia and the Ukraine, have had a long history in producing sunflower. With the advent of government and economical stability, the area for sunflower planting has been progressively increasing in the last ten years. The combined acreage in 2003 peaked at 8.71 million hectares but is expected to decline in 2004 due to government pricing policies which favor grains. This region has taken advantage of its central location to North African oil markets and seed export markets in Western Europe and Turkey. The combined Black Sea production has dominated the world's sunflower seed exports, often representing over 50 percent of the total. This region has been second only to Argentina in sunflower oil exports. This scenario may change as domestic consumption of vegetable oil in Russia and the Ukraine may be increasing. New crushing capacity is also

being added which may limit the export of sunflower seed in the future but could add to sunflower oil exports. Both Russia and Ukraine have used export taxes to manage supply and insure domestic needs.

The elimination of most central government buying agencies may also have contributed to the decline of sunflower as a percentage of world production. Throughout much of the 1980s and early 1990s, several countries purchased either sunflower seed or sunflower oil on the world market through government purchasing agencies. Often times, these agencies were willing to pay premiums over world market prices for sunflower oil/seed. Examples included Egypt which purchased only sunflower or cotton oil, occasionally at a considerable premium to world oil values. Algeria tended to purchase mostly sunflower oil through their government buying agency. The Government of Mexico tendered for considerable volumes of either sunflower seed or oil, often times well over world prices. There are other examples. These government buying groups or agencies were insulated from world market values through monopoly buying and selling to domestic crushers/refiners or consumers. Most of these monopolies have been disbanded in favor of private initiatives. The private companies now buy other oilseeds/oils and are very sensitive to world values and able to substitute vegetable oils when prices dictate even though consumers may have a preference for sunflower oil. The result has been fewer price spikes for sunflower seed/oil and a lower price premium compared to some of the other competing oils. This has partially reduced the incentive for some farmers to plant sunflower.

***Finding the Market Niche.*** Most of the world's volume vegetable oil buyers have become price sensitive buyers and there is little likelihood that this will change in the next few years. To compete in that arena one must consistently be a low priced seller. Sunflower producers are not well suited for producing the cheapest oil when competing against the huge volumes of inexpensive soybean and palm oil. Again, it is important to note that sunflower gets the majority of its value from its oil while soybean values are dominated by protein.

Some sunflower producing countries have been developing sunflower with altered fatty acids to be able to enhance sunflower value in specific markets (Table 1). Traditional breeding methods have been employed in all cases. High oleic acid sunflower oil came to the

Table 1. Typical range of fatty acid concentrations of three types of sunflower oil on the world market.

| Type of Sunflower | Linoleic (18:2) (%) | Oleic (18:1) (%) | Palmitic (16:0) + Stearic (18:0) (%) |
|---|---|---|---|
| Traditional | 60 to 68 | 20 to 28 | 12 |
| High Oleic | 7 to 13 | 75 to 85 | 8 |
| Mid Oleic | 21 to 31 | 60 to 70 | 9 |

market in the 1980s in small volumes. High oleic sunflower oil has an oleic content of over 75 percent. The advantage of this oil is better frying stability, especially in manufactured foods. However, high oleic sunflower acreage did not increase significantly because of limited supply, and the price of the oil was quite high compared to traditional linoleic sunflower or other competing oils. A US patent was involved as well which may have contributed to its slow market penetration. In addition to the USA, Argentina and the EU are known to produce small volumes of high oleic sunflower oil as well. Although there is not a

public record of high oleic sunflower oil pricing, it is assumed that the price premium of high oleic over traditional sunflower oil is between 30 to 50 percent.

The US sunflower industry developed a mid-oleic sunflower oil known as NuSun™ in anticipation of a change in manufactured food labeling laws. It was anticipated that the Food and Drug Administration would require the labeling of trans fatty acids. Trans fatty acids develop when an oil is hydrogenated. A significant body of research points to trans fatty acids as being detrimental to heart health. In September of 2003, the US Food and Drug Administration announced that all packaged food products must include the amount of trans fatty acids on the product label by January 1, 2006. Canada has a similar labeling requirement starting in December of 2005. Some Canadian and US companies have already announced product changes eliminating hydrogenated oils, and thus trans fatty acids. Mid-oleic NuSun sunflower oil is one of several oil choices that can be used to replace hydrogenated oils.

The NuSun sunflower oil fatty acid profile has oleic values of 55 to 75 percent, saturates of 9 percent and the remainder is linoleic acid. The oil has been rigorously tested in numerous frying mediums and has become the 'Gold' standard in conducting fry test comparisons. NuSun provides a very pleasing flavor in most food uses. Human and animal testing indicates the NuSun can lower LDL (bad) cholesterol.

The US sunflower industry made the switch to NuSun to gain greater value for producers and the industry. Prior to 1999, about 75 percent of the sunflower oil produced in the US was exported (Figure 7). This heavy dependence on exports was considered a detriment to gaining higher value for the producer. After just a few short years, the US sunflower industry is now 70 percent domestic dependent and that percentage is likely to go higher.

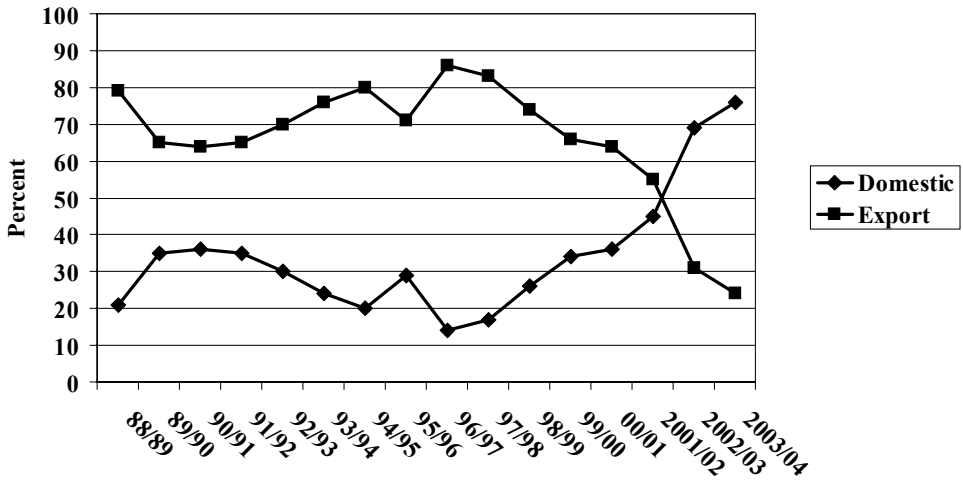


Figure 7. USA sunflower domestic and export oil sales from 1988 through 2004.

***The Future.*** What is the future for world sunflower production? Certainly, challenges will continue for this oilseed. A key for some countries will be to find value niches in the market place that will pay a premium over most other vegetable oils, and thus provide a better

return to the farmer. That is necessary in countries where farmers have several crop choices and look to the market in their planting decisions. Those choices are based on crop rotational requirements, cost of production, labor and capital required to produce the crop, access to markets and finally potential economic return per hectare. High oleic and mid-oleic sunflower are examples of efforts to find value over and above conventional sunflower. There may be opportunities for high linoleic sunflower as well in the manufacture of Conjugated Linoleic Acid (CLA) which may have particular health benefits. It would appear that for most sunflower producing regions attempting to compete in the world market as a low priced vegetable oil—competing with soybean and palm oils—is not a viable market strategy. Sunflower oil must be positioned, as it has in the past, as a premium oil with enhanced value to the consumer.

The value of vegetable oil is paramount to the value of sunflower seed. Will vegetable oil be the price leader for the next ten years? In the past ten years protein has been the price leader most of the time. Exceptions have usually occurred when palm oil production has gone into recession every fourth year. What is the future of SE Asian palm oil? Has Malaysian palm oil production peaked due to land availability? Will the cost of producing palm oil in SE Asia increase with higher land values, labor costs and processing costs? What is the future of vegetable oil in biofuels? Several countries including those in the EU have made major inroads in the use of vegetable oils as a diesel fuel extender. Will that trend continue and is it dependent on government tax incentives or other government mandates? Can vegetable oil compete in a fuel market without such incentives or mandates? The answers to these questions are not clear but there is some optimism in most categories.

We can assume that protein demand will continue to be strong as most of the world consumers want to eat more meat, eggs and other animal products. Soybean meal will continue to dominate this market. It is unlikely that the demand curve for soybean meal will decline in the near term. When soybean prices need to increase to attract more production, it is most always protein values that carry the majority of the price increase. That is always a detriment to high oil content seeds such as sunflower and canola/rapeseed when farmers have a choice in which of the three oilseed crops to plant.

Innovations in producing sunflower, disease resistance and yield enhancement are equally important to price in sunflower maintaining or increasing the existing world market share among oilseeds. It is unlikely that sunflower will be genetically modified in the near term. But the recent development and market introduction of Clearfield® sunflower from the BASF Corporation to control most weeds in a single post-emergent herbicide application is a significant breakthrough in sunflower production. Progress in identifying disease-resistant breeding lines is being made. Recently, USDA ARS released several lines resistant to Sclerotinia head rot. This is especially important for rotations that might include other broad leaf crops like soybean. Immunity to the newest race of downy mildew is available. More progress in this area will be necessary to keep up with competing crops. Sunflower yield increases are not easily discernable when looking at international averages. However, it has already been pointed out that some of the world's sunflower area has been relegated to regions of the world that are not as favorable to producing high yields. It can only be assumed that the amount of money being spent on sunflower research, both public and private, is dwarfed by the amount being spent on crops such as corn and soybean.

Finally what is the future soybean production, the king of all oilseeds? It appears that US soybean production has peaked and is unlikely to increase much beyond existing levels

without major yield enhancing developments. However, the expansion potential in South America, especially Brazil, appears to be significant. Are there other soybean production regions not yet identified? Might parts of the Black Sea region be conducive to soybean production?

There is also the issue of the World Trade Organization (WTO) agreements that might lower tariffs and lower production subsidies. The US farm program expires in 2007. Budget concerns and a successful WTO challenge to US farm subsidies could bring changes. All of these policy issues may have an impact on future crop choices. It is clear that in much of the world, the market place and not governments will govern what farmers plant. However, governments will continue to influence what consumers eat through such mechanisms as labeling laws. The growing concern of obesity in many parts of the world is a particular challenge to government and the health community. This issue has implications to agriculture. How oilseeds and in particular sunflower fit into this and other concerns may provide interesting opportunities.

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