

INTERVIEW

**Nobel Peace winner Dr. Norman E. Borlaug talks to FI
Bringing the Green Revolution to Africa**

Dr. Norman Borlaug, winner of the Nobel Peace Prize, has been called "The Father of the Green Revolution." It has also been said that he provides food for the mind, as well as for the body. Fertilizer International was particularly honoured to interview Dr. Borlaug at the recent IFA Annual Meeting in New Orleans. Although he is approaching his 80th year, Dr. Borlaug continues to devote his considerable energies to ending the spectre of famine and under-nourishment in the sub-Saharan region. Food security has proved especially elusive in Africa, but - in his capacity as President of the Sasakawa Africa Association (SAA) - Dr. Borlaug is helping to lay the foundations for a transformation in the region's agriculture.

You retired officially in 1979 as Director of the Wheat Program of the International Maize and Wheat Improvement Center (CIMMYT), but have led an active life since then. What have been your main activities?

I did not sever my links with CIMMYT, but continued to work for them as a consultant. Then Mr. Ryoichi Sasakawa called me in 1984. He had donated a large sum of money to UNICEF, but he wanted to know why nothing had been done to transfer modern agricultural technology to sub-Saharan Africa. He invited me to join him in developing an agricultural program for Africa. At first, I was not so sure, and I recall that our conversation went something like this:

"But I'm too old to start."

"I'm 15 years older than you!"

"OK, I'll start."

"We should have started yesterday; we better start tomorrow."

So we did...

Ex-President Jimmy Carter is also closely involved in the Sasakawa Africa Association. One of my earliest jobs in 1985 was to organize a workshop in Geneva, and two days before it was due to begin, Mr. Sasakawa contacted Jimmy Carter, converting him to the cause. He agreed to participate at the Geneva workshop, and has remained very enthusiastic in his efforts to encourage Africa's self-sufficiency in food.

Our joint programme is called Sasakawa-Global 2000.

What have been the main achievements of Sasakawa-Global 2000 to date?

Since 1986, we have been involved in food crop production technology transfer projects in sub-Saharan Africa, operating in six countries: Ghana, Benin, Togo, Nigeria, Tanzania, and most recently, Ethiopia. Previously, we operated similar projects in Sudan and Zambia.

The heart of these projects has been dynamic field testing and demonstration programmes for major food crops in which improved

technology had been developed by national and international research organisations, but for various reasons was not being adequately extended among farmers. There was no shortage of available information, but much of it was not being effectively utilised. This is why we chose to work mainly on extension projects and demonstration schemes, and so provide a bridge between research and application.

There is all too often a no-man's land between research and extension in the less-developed countries, and is exacerbated by different levels of education.

Over the past seven years, we have worked in close harness with national extension services, and more than 150,000 one-acre production test plots have been cultivated by small-scale farmers. These plots have been concerned with demonstrating improved technology for basic food crops, such as maize, sorghum, wheat, cassava and grain legumes.

Our packages of recommended production technology include:

- The use of the best available commercial varieties and hybrids.
- Proper land preparation and seeding.
- Proper application of the appropriate fertilizers and other chemical inputs, as appropriate.
- Timely weed control.
- Moisture conservation and/or better water use if under irrigation.

We have also worked with participating farming families to improve on-farm storage to allow farmers to hold stocks longer and reduce post-harvest losses. In nearly every case, yields are between two and three times higher - or more - than the control plots employing the farmer's traditional methods. Sudan was a particular success story for us. The country was facing a crisis in its food supply, as wheat production had fallen to just 150,000 t/a, and was going down towards zero. It is now back up to 800,000 t/a.

Do you think that sub-Saharan Africa could ever solve its food crisis?

I am convinced it can! Global 2000 has confined its efforts to second-tier agricultural countries, south of the Sahara, which offer plenty of unexpressed potential for food production. We have already seen encouraging signs of take-off in Ghana and Tanzania. Despite the formidable challenges in Africa, I believe that the elements which worked in Asia and Latin America will also work in Africa. If effective seed and fertilizer supply and marketing systems are developed, sub-Saharan African countries can make major advances in improving the nutritional and economic well-being of their hard-pressed populations.

Although the developed countries do not like to refer to them, subsidies are still important in encouraging agricultural development. While too much subsidy on fertilizer by governments

clearly leads to waste and corruption, at Global 2000, we believe that some level of subsidy - 10 to 30% - can be justified, especially in pre-Green Revolution low-income agrarian countries, such as in those of sub-Saharan Africa. Even the most ardent free marketeers can justify some level of subsidy on the basis of infant industries, transportation constraints, social equity and environmental protection. This is especially pertinent in the case of Africa. Elsewhere, in the formerly centrally-planned economies in Asia and Eastern Europe, large public-sector organisations are being transformed into private businesses. By contrast, public-sector fertilizer activity exists in few sub-Saharan African countries, and a dynamic, private fertilizer sector must be built from scratch. This will need careful nurturing.

Above all, if agriculture in sub-Saharan Africa is to take off, farmers should be encouraged to produce more than they actually need for their own consumption, and so build up their purchasing power.

What other obstacles remain?

Traditional farming practices have not always been beneficial. Nomadic farming with slash-and-burn methods have been particularly harmful. The way to stepping up food production does not so much lie in bringing fresh land into cultivation as in making better use of the existing cultivated land. This is where I take issue with the World Bank, who are saying, "Why should you use fertilizer, when you can extend the land under cultivation?" While one can always clear the brush, fertility deteriorates or is lost within three or four years.

We cannot make the transition overnight. In this respect, fertilizers play a key role, as higher yields per acre will be the most persuasive argument in coaxing sub-Saharan farmers away from slash-and-burn.

We have many other obstacles to overcome, such as the poor infrastructure and transport systems throughout the region. The quality of transportation has deteriorated, and requires massive investment to make it more effective. Education is another fundamental problem, which is even more deep-rooted, and is exacerbated by the tendency of the most talented people to move away from the rural areas into the cities. Upgrading regional and national extension services will only occur if education and training are improved at every level.

Is there any risk that the first Green Revolution will lose momentum?

The burgeoning population in Asia and Latin America means that we cannot relax and presume that food security in these regions is now safe for all time. There is still ample scope for more widespread and better application of existing technology. In the case of China and the United States, which are already at high yield levels, further food production increases will be difficult, and will depend on farmers becoming even more skilled crop managers.

Two key problems remain: firstly, the complex task of producing sufficient quantities of the desired foods to satisfy needs, and to accomplish this feat in environmentally- and economically-sustainable ways. Secondly, and even more challenging, the effective and equitable distribution of food. Among the continuing impediments to equitable food distribution is poverty, lack of purchasing power, which is in turn made more severe by rapid population growth

But are falling birth rates relieving some of the pressure, as societies become more prosperous?

While birth rates are falling in North America and Western Europe, the population continues to rise in Africa, Latin America and also in Asia, much of which is already densely populated. Standards of living will remain strained until the level of population growth eases off. The desire for a large family is still a potent social force in many Asian countries. Only when there is a measure of social security and the prospect of increased longevity in such countries as India and Bangladesh will population growth be effectively curbed.

A degree of coercion to limit family size - as practised by the Chinese authorities - may have some validity, but I prefer more positive incentives. Tax rebates and other benefits - such as free medical aid, education or the provision of better housing - would increase the attractions of having small families.

To what extent could trade restrictions be an obstacle to future global food security?

Too many groups of people look through the eye of the needle of their own special interest. The developed countries pursue their own special interests, putting real pressure on the international trade negotiators. Had the world's food supply been distributed evenly in 1990, it would have provided an adequate diet for 6.2 billion people - nearly one billion more than the actual population.

At best, the governments of most low-income, food-deficit nations only have the foreign exchange to import the minimum amount of food required to avoid hunger and social unrest in the cities. The problems of hunger and famine are most acute in the rural areas. Even if the governments had the resources to import food for distribution in rural areas, they would be confronted with massive problems of transporting and distributing the commodities among a dispersed rural population. The answer to the problem of eliminating the remaining pockets of hunger thus lies with expanding food production in the low-income countries. An unfavourable climate for world trade in agricultural and other products would certainly make this goal more difficult to achieve, as countries and different trading blocs would be tempted to follow beggar-my-neighbour policies.

You have indicated your support for limited subsidies. At what point does food production become sufficient to warrant the removal

of fertilizer subsidies?

It is always difficult to choose the appropriate time to phase out subsidies. Instability follows if subsidies are removed too quickly, and this in turn leads to distortions in other sectors of the economy. Let me cite the example of the 1973/74 Energy Crisis to show how such distortions do long-term damage. The crisis did not benefit the US agricultural industry. After commodity prices skyrocketed, and then fell back just as sharply to their previous levels, US farmers cut back their production, only to be caught out by the subsequent drought in the Soviet Union. There then followed the second Oil Crisis of 1978/79. As prices of all commodities were inflated by the influx of petrol dollars, farmers rushed to buy more land and machinery, while the banks further stoked up the spending boom. The downturn of the mid-1980s was especially catastrophic for US agriculture, and it had a knock-on effect in the fertilizer and farm equipment sectors.

You have referred to the "noisy environmentalists." How did they gain centre-stage in the policy debates in the industrialised world?

Much of the public confusion concerning the adverse effect of fertilizers and crop protection chemicals on food safety began with "Silent Spring". Rachel Carson's book, which was published in the 1960s. Insecticides have gained a bad press, via their connection with DDT, and this has spread to chemical inputs in general. This confusion could have been avoided if business leaders and scientists have countered the exaggerated accusations being made by the more extreme elements in the environmental movement with good scientific information. Instead, they kept silent, hoping that the environmentalists would fade away - a big mistake.

The less developed countries have also come under pressure to cut their use of chemical inputs, (including fertilizers), despite the prevalence of many virulent insect-transmitted diseases.

So far, agricultural research and production advances have kept the rate of food production ahead of aggregate world population growth, but this cannot be assumed to continue indefinitely. Even if breakthroughs in science and technology permit us biologically to produce food for twice or three times the present population, we are deeply concerned that mankind could be taken to the brink of disaster in the hope that a scientific miracle at the last minutes will somehow save the day.

But do the environmentalists not reflect some fundamental policy concerns?

It is all too easy to lose a sense of perspective over environmental matters. Volcanic explosions are more destructive of the ozone layer than hair-sprays! Some environmental propagandists have manipulated popular idealism and ignorance for their own ends. For example, in the case of global warming, the scientific data is insufficient to formulate official policies. Indeed, scientists are uncertain whether global warming is going to become worse, or whether we are on the verge of another Ice Age. I personally

believe that any changes in the world temperatures and climate will be gradual over many years.

There is real risk that billions of dollars are being thrown at presumed problems. Some of the blame lies with competitive grant systems, whereby our universities receive funds supplemented by federal grants. They are consequently tempted to rush through their research programmes in order to secure the grants. If we are indeed facing another Ice Age, it is unlikely to be reversed by passing a few extra laws to control the use of fossil fuels.

Could the environmental tide be turning?

If so, how do we get back to the middle of the road? No-one in the fertilizer industry wants to pollute or damage the environment, but people should be given credit for their honest attempts to return to a more balanced approach to environmental issues. There is no shortage of idealism, which needs to be reconciled with certain painful realities. For example, the continuing increase in the human population will inevitably put pressure on the available land. Who is to decide what land should be taken up for agricultural production, and what should be left as wilderness?

You have urged such organizations as TFI and IFA to police their own members and mount major educational campaigns to inform the media and general public about the benefits of fertilizer. How feasible is this, given limited budgets, and other factors?

The fertilizer industry is surely capable of mounting a campaign to counter the misinformation and an inadequate appreciation of the issues at stake in eliminating hunger and malnutrition. By targeting such a campaign at schools, much of the ignorance of the average citizen can be offset. When things get out of proportion, as with the nitrate debate, the industry associations should also respond quickly, and produce counter-publicity, targeting the legislators, and sending additional bulletins and brochures to the high schools.

Will there be a second Green Revolution?

Yes, but I will not be around to see it! The fertilizer industry must keep promoting it. Most of the attention worldwide is currently focused on the former Soviet Union and Eastern Europe, while Africa is still neglected. Similarly, Latin American countries have feared that the opening up of the Eastern Bloc would divert development funds there.

Africa does not need mega-funds to improve its food security, but western donors want a quick pay-back for all of their investments - which Africa cannot offer at this stage. This is why environmental issues add to the confusion in priorities.

Ultimately, it is a question of agreeing on priorities. Everything comes back to the forecasts of world population growth in the first half of the next century, and how best to slow it down, while improving the standard of living of the new-born and existing population.