

PERSPECTIVE



Time to unleash rice

Corporate inefficiency and government meddling are curbing production of the vital crop in the countries that need it most, says **Robert Zeigler**.

Growing rice should be a reasonable way to make a living. After all, half the people in the world depend on rice as their staple food. But even in an age of remarkable agricultural advances, millions of rice farmers and their families continue to scrape by at the very edge of existence. Scientists have made progress in understanding the rice plant. More than ever, they understand the genetics, growing conditions and agricultural techniques that can lead to improved yields. Further insights will open the door to future revolutions in rice productivity, even in the face of a changing climate and other challenges. But there is a risk that many farmers will be left behind.

The current system of rice production is rife with inefficiency, from the paddies to the village trading posts to the international market. Seed companies are doing too little to support the rice-growing industry. At the same time, governments of rice-producing countries are trying to do too much. For the sake of small-scale farmers — and world food security — private enterprises and governments need to unleash rice's potential to promote stability.

Seed companies have become central to the story of rice. Today, many companies are creating an array of hybrid strains that have been specially bred to withstand pests and produce more grains, but many farmers miss out on these innovations. Different strains thrive in different conditions — a variety that grows well in a high latitude may struggle in the hot, wet tropics. But some companies make little effort to match their hybrid offerings to local conditions, especially in the most impoverished areas. And although hybrids can produce impressive yields, they often have inferior grain quality, which makes the rice hard to sell at the market, a big problem for farmers whose livelihoods depend on sales. Worse, hybrid seeds can cost ten times more than inbred rice as companies try to immediately recover the costs of research and development. Not surprisingly, many farmers choose to reuse the seeds from the same inbred varieties that have remained basically unchanged for hundreds of years, with the unfortunate consequence that they lose any chance to improve their harvests or their bottom line. They simply cannot grow the same rice in the same ways and hope for better harvests and bigger profits.

Thanks to advances in genetics, the strains available to seed companies are bound to improve. The May 2014 publication of the results of the first stage of the 3,000 Rice Genomes Project — a programme funded by the Bill & Melinda Gates Foundation and the Chinese Ministry of Science and Technology to sequence 3,000 rice strains — means that scientists will soon be able to identify many key genes that govern traits such as the quality of the rice grains and resistance to stress (The 3,000 Rice Genomes Project *GigaScience* 3, 7; 2014). But it is time — past time, really — for the seed companies to do their share. Instead of offering the same hybrids to every customer, no matter what the local needs or preferences are, imaginative companies must find a way to get superior seeds, including inbred varieties as well as hybrids, to rice farmers. Tailoring seeds to the needs of farmers will take research,

time and a hefty initial investment, but the company that can successfully bring hardy, high-producing, affordable rice to the paddies of the tropics in India, Bangladesh, Vietnam and elsewhere will profit handsomely, and so will the farmers.

TRADE-OFF

Government policies that stifle the rice trade are an impediment to growth and prosperity. In most Asian countries, rice permeates the culture, and the suggestion of rice shortages can translate into a social crisis. To avoid this, governments often limit exports to prevent scarcity. This approach stands in contrast to wheat — a global staple that is traded internationally as a commodity, not as a cultural symbol or political tool.

If there is a rice policy that hinders the market and hurts either farmers or consumers, you can be sure that at least one country has tried it. Some, including Vietnam, intentionally keep rice prices low to make it

more affordable for consumers, but this impoverishes farmers and discourages them from investing in hybrid rice or better equipment. Thailand recently took the opposite approach by paying farmers inflated prices for rice to boost their income. Although laudable in intent, the policy killed the country's once-lucrative rice export market. Thai rice became so expensive that international traders were reluctant to buy it. Reuters reported that by the end of May 2014, the country had lost US\$9.9 billion from a 16-month scheme to help rice farmers, leading to a financial crisis with repercussions that are still being felt. The then-prime minister, Yingluck Shinawatra, who had been elected in 2011 largely on the basis of her promises to help farmers, was deposed in a military coup in May.

Erratic government intervention in the international rice trade causes far more problems than it solves. Sudden trade moratoriums imposed by India, Vietnam and some of the world's other major rice exporters during the global food panic of 2007 and 2008 increased the average price of internationally traded rice by more than 160%. Governments must first relax their rice policies so that surpluses can be traded openly on the international market. Rice farmers, even small-scale ones, can benefit from an orderly and transparent market. If farmers can have some confidence about what their crop will be worth, they can plan ahead and make better decisions at planting time. This will require the creation of a global, or at least regional, rice exchange where prices are negotiated and published daily.

It is up to the rice-growing countries of the world and the private sector to bring rice into the modern age. Growing the right varieties in the right places, under the right policies, and traded openly for the right prices will create stability — in the food supply, in financial systems and in governments — that is sorely lacking today. ■

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