

Collaborating in China

Many of China's hungriest people are farmers, especially in densely populated rural hinterlands and remote highlands. At the moment the population is just below 1.3 billion and growing at a rate of 11 million per year. Ensuring those millions have enough to eat is a central feature of the country's long-term

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Potato successes contribute to China's anti-poverty program

Since 1978, the percentage of people in the rural population considered poor, by Chinese standards, is estimated to have fallen from 30 percent to less than 3 percent. CIP collaborates in several programs which have and still are contributing to the success of China's anti-poverty program. High among its contributions is a potato developed from CIP crosses in collaboration with the Root and Tuber Crop Research Institute of Yunnan Normal University and the Huize Agricultural Extension Center. Named Cooperation 88 to reflect the importance of partnership in its development and testing (and its origins as S-88 – a CIP cross), this high-yielding variety with superior processing characteristics is currently grown on more than 100,000 hectares in Yunnan alone, as well as in adjacent provinces. Cooperation 88 seed tubers

are also traded over China's borders into neighbouring Vietnam and Burma.

True potato seed (TPS) is another valuable contribution that CIP is making to the eradication of rural poverty in China, especially in regions that are difficult to reach, where transportation costs make seed tubers prohibitively expensive. The advantages are obvious: a handful of TPS will produce enough seedling tubers to plant one hectare of potatoes, an area which would require 2 tonnes of conventional seed tubers. Yunnan's agricultural department began making CIP's TPS varieties available to farmers in the western and eastern extremes of the province in 2001, and since then plantings have reached 1,000 hectares in total. "That might not sound like much," says geneticist Enrique Chujoy, who co-ordinates CIP's role in the initiative. "But most of the plots making up that total are very small. There are probably several thousand households involved." And for them TPS is invaluable. Labour-intensive and time-consuming? Yes,

since producing edible potatoes from TPS is a two-stage, two-season affair. In the first year plants are grown from true seed to produce seedling tubers; in the second, those tubers are planted out to produce a mature crop. But double effort has a double advantage: at the first stage farmers can produce tubers for sale, as well as for themselves; at the second they are assured of a good crop.

"The great thing about TPS is that it can help disadvantaged sections of society in regions where mainstream advances in agricultural technology simply aren't applicable," says Chujoy. "It will never replace clonal crops totally – the economics of time and labour are against it – but a kilo of TPS in the right place can feed a village – and give the villagers an income. We have to work with these farmers, and focus our efforts specifically on their needs."

To increase the effectiveness of its work in China and the region, CIP has been continuing to work with the Chinese government to create the CIP-China Center for Asia and the Pacific. CIP is



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collaborating with the Chinese Academy of Agricultural Sciences and the Ministry of Agriculture in establishing the Center, which will focus initially on work in areas where potato and sweetpotato can contribute most to reducing hunger and raising incomes.

Sweetpotato increasingly important in generating income

As the purchasing power of households at all levels of society in China has increased, people have diversified their food choices, consuming less rice and

more meat, horticultural produce and processed foods. Starch is the principal constituent of processed foods such as noodles and snacks etc. Sweetpotato for starch extraction is therefore much in demand – so much so that it has ceased to be a staple food and is now grown primarily for starch or animal feed. But even while its use as a food has declined, sweetpotato production has increased. “In this way sweetpotato continues to serve China’s farmers well,” says economist Keith Fuglie, leader of CIP’s Impact Enhancement Division.

China is by far the world’s largest producer of sweetpotato, its annual output of almost 100 million tonnes accounting for about 85% of global production. The volume that goes into food processing is vast, but medium- and small-scale production systems are vital components of the industry. At the same time they are especially vulnerable to the pressures of China’s rapidly growing market economy.

In the late 1980s, CIP began collaborating with Chinese scientists on methods to improve the post-harvest use of sweetpotatoes. Notable



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successes were achieved. By the mid-1990s the collaboration's improved starch extraction and noodle-making technologies were being widely adopted. Attention has now turned to questions of scale and efficiency as the key to making small operators more productive and competitive – especially those working in sweetpotato-pig production systems.

Making silage dramatically improves prospects of a better life

Research in Vietnam and Papua Province, Indonesia had

shown that a CIP-developed ensilage method of making pig feed from sweetpotato significantly increased the productivity of traditional sweetpotato-pig production systems. Instead of chopping up and boiling sweetpotatoes for feed, villagers were shown how to use fermentation to make the food digestible. Costs were reduced; pigs fattened faster and household incomes rose. This simple but highly effective CIP-developed technology has subsequently been a key element of projects seeking to improve the sweetpotato-based pig

production systems in the uplands of China's Sichuan Province.

Along with improved sweetpotato varieties developed by the Sichuan Academy of Agricultural Sciences (SAAS) in collaboration with CIP, scientists from the Sichuan Animal Science Academy (SASA) working on an International Livestock Research Institute (ILRI) initiative, put CIP ensiling technology high on the list of options they offered the farmers of Tianle and five other villages situated about 170 km north-east of

Chengdu. The majority of farmers in Tianle are very poor, with average *per capita* incomes of less than US\$100 per year. Livestock contributes up to 80% of total farm income. The project has dramatically improved their prospects of a better life. "The use of the improved sweetpotato variety resulted in at least 25% increment in root yield," a report on the project reveals, and all farmers who planted improved varieties increased the area planted to that variety in the second year and established multiplication plots to ensure they had enough planting material to cover it. One of the farmers, Mr. Liang Dong Shen said, "Last year I produced enough roots of the new variety not only to ensile, and reserve seeds for this year's planting, but also to give 100 kg as presents to my friends, and even sold 500 kg."

The practice of making silage was also enthusiastically received. All the farmers appreciated not having to cook the sweetpotato roots and vines for their pigs – not least because it spared them two hours or more of hard

work every day. Moreover, it saved fuel-wood (and the time devoted to collecting it) and reduced pressure on the forests around them. But it was as an improved feed that the farmers most valued the technology. With the addition of a protein-rich supplement developed by SASA scientists, the sweetpotato silage feed reduced the time taken for pigs to reach market weight by 6-8 weeks. This meant that more pigs could be raised per year – in some instances 100% more. "Last year Tianle village sold 300 pigs," village leader Mr. Liang Bo told the scientists in early 2004. "But this year we have already sold 380 in the first quarter alone. I estimate that we will sell at least 1200 fattened pigs in 2004, when the average for previous years was less than 800."

The additional income derived from these enterprises is already changing lives in the village. Overall, farmers felt confident of being able to commit themselves to investment expenses that would build upon what has been achieved so far. Two farmers, Mrs. Ye Yongju and Mrs.

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Jufang, said the project had enabled them to send their children to an agricultural college. Others said that some of the additional income was being reinvested in the farm, and the rest put into savings. But perhaps the most visible indication of the changes brought to Tianle by the project are the motorcycles some farmers have bought. "Twenty-five farmers in Tianle village have bought motorcycles this year," Mr. Liang Bo announced proudly. "All thanks to extra income obtained from the pig enterprise."



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