



CIMMYT

INTERNATIONAL MAIZE AND
WHEAT IMPROVEMENT CENTER

The coming of independence in 1991 triggered tremendous political and economic changes in the nations of Central Asia and the Caucasus (CAC).^{*} In the period immediately after independence, the area planted to wheat, wheat production levels, and wheat yields decreased considerably. Due to the efforts of national agricultural research programs (NARS) working in conjunction with organizations such as CIMMYT, wheat production and wheat yields in most of the region have started to increase in recent years. However, yields could be much higher and production far more profitable, and much remains to be done before wheat production becomes an efficient enterprise in the region.

^{*} Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan.

IMPACTS OF CIMMYT RESEARCH IN THE NATIONS OF CENTRAL ASIA AND THE CAUCASUS

Beginning in the mid 1990s, CIMMYT's involvement in CAC has deepened, especially since the opening of a regional office in Almaty, Kazakhstan, in 1998. We are actively working on technologies specifically targetting the region's major wheat production systems through the scientists posted in Kazakhstan, which is by far the largest wheat-producing nation in CAC. CIMMYT is already generating technologies to help farmers in CAC, as evidenced by the impacts reported here.

CAC WHEAT PRODUCTION: COMPETITIVENESS AND CONSTRAINTS

The baseline studies of the wheat sectors of Kazakhstan and the other CAC nations conducted by CIMMYT economists and other experts underpin our work in the region. These studies have focused on the economics of wheat production in CAC and on issues related to the competitiveness of the wheat sector and its potential for growth in the light of the technologies available within each country and in the region.

The main conclusion of the wheat sector study in Kazakhstan is that research should focus on developing low-cost technologies (improved varieties and input-saving agronomic practices). Studies of the CAC region in general indicate that the grains sector has become more competitive since the change to a much less input-intensive agriculture, but that it could become even more competitive if farmers had greater access to low-cost technologies and inputs, plus the credit to buy them, and to cropping practices that increase yields while helping the environment.

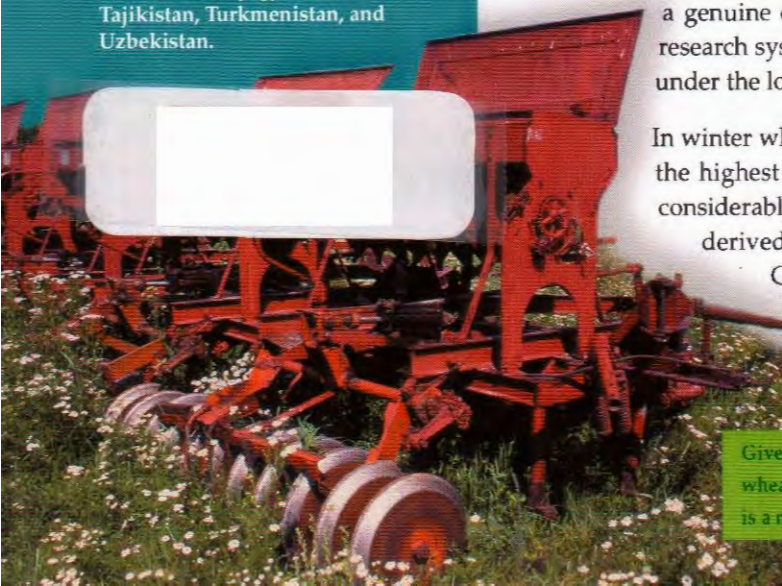
The goals of CIMMYT's Economics Program in the region are to gain a better understanding of the problems and decision-making structure of the new production units and to ensure that the correct technological priorities are being addressed, thus maximizing the likelihood of success.

IMPROVED WHEAT VARIETIES

A vigorous exchange of wheat materials between CIMMYT-Mexico, the International Winter Wheat Improvement Program (a Turkey-CIMMYT-ICARDA project), and the CAC countries started in the mid 1990s. It has resulted in superior wheats that compete well with local materials. CIMMYT has established a genuine collaboration with researchers in the national agricultural research systems (NARS), who are testing CIMMYT-derived materials under the local conditions, using their own facilities.

In winter wheat trials conducted in six CAC nations from 1997 to 1999, the highest yielder was invariably a CIMMYT wheat that produced considerably more grain than the local wheat. In Tajikistan a CIMMYT-derived winter wheat is already under production, while other CIMMYT-derived materials are being officially tested in Armenia, Azerbaijan, Georgia, Turkmenistan, and Uzbekistan, and more advanced wheats are being evaluated in Kazakhstan and Kyrgyzstan.

Given that the use of machines continues to be important in the region's wheat production systems, the inability to repair or replace existing machinery is a major obstacle to raising wheat yields in CAC.



As for spring wheat, more than 75% of which is grown in northern Kazakhstan, a breeding program "shuttles" materials between Kazakhstan and Mexico to be grown under the contrasting conditions prevailing in the two countries. This should accelerate the breeding of wheats that combine drought tolerance with disease resistance and good grain quality for northern Kazakhstan and Siberia. These varieties will also be insensitive to day length, which is indispensable for the long growing season in the north.

AGRONOMY

Agronomy plays a pivotal role in increasing yields, particularly in low-yielding areas. It is indispensable for reversing the effects of decades of damaging farming methods. In addition, the privatization of agricultural lands and the shift to new types of production units make it imperative to develop new agronomic practices and new methods for transferring information about them to farmers.

On-farm trials, which are a new, but welcome, concept to local researchers, have tested different combinations of simple technology components, such as variety, fertilizer, and sowing date, that could generate a high rate of return on low investments by farmers. Other practices that may help improve farm productivity are keeping crop residues in the field after harvest to conserve soil moisture, adjusting the sowing date so as to raise yields and get better grain quality, and expanding the range of crops grown in rotation with wheat.

Most CAC farmers, large and small, still have no access to credit from banks. Strapped for cash, they have drastically reduced or even completely stopped using purchased seed, fertilizer, and fuel. These farmers urgently need cropping practices that are not only more productive and less damaging to the environment, but also call for few purchased inputs. In response to these needs, regional on-farm trials and

demonstrations to promote improved varieties and new cropping practices have been initiated and will remain an important feature of CIMMYT's work in CAC.

IMPROVING NARS

CAPABILITIES

Among the first things that CIMMYT undertook in the region was to promote more communication and closer links among NARS scientists themselves and with the international scientific community. The CIMMYT office in Kazakhstan has organized or coordinated numerous training courses in English language skills, wheat breeding and agronomy, and computer science. It has also organized traveling workshops that have allowed regional scientists to meet their colleagues in the other CAC countries and to appreciate the circumstances in which they have to work. For the second year in a row, researchers from CAC have traveled to CIMMYT Headquarters in Mexico to attend a six-month course in wheat breeding. All this has improved the research skills of NARS staff and the interaction and communication among them.

REGIONAL NETWORKING AND PARTNERSHIPS

To address the complex problems that plague the region, CIMMYT has entered into partnerships with other CGIAR centers, ARIs, and NGOs. It has also set up excellent working relations with regional NARS, helping them establish research priorities and put together a plan of action to tackle them.

New technologies are being evaluated through regional testing networks and projects in which CIMMYT

collaborates with various partners. A sampling of these efforts:

- The **winter wheat improvement network** (CAC-WWINET) relies on the collaboration of 12 breeding programs in 8 countries, including the International Winter Wheat Improvement Program (IWWIP, a Turkey-CIMMYT-ICARDA project), plus CIMMYT-Mexico, and CIMMYT-Kazakhstan, which is coordinating the effort. The network engages in the regional exchange and cooperative evaluation of new wheat materials; it also publishes a newsletter and organizes meetings and training sessions.
- The **Kazakhstan-Siberia Spring Wheat Network** (KASINET), consists of eight breeding programs in two countries, plus CIMMYT-Mexico and CIMMYT-Kazakhstan. Besides promoting the regional exchange and cooperative evaluation of wheat materials, KASINET is conducting shuttle breeding with Mexico and is involved in training and communication.
- A **GTZ-CIMMYT** initiative is the first project to help Tajikistan's national agricultural research program, which was torn apart by civil war. The project aims to revitalize cereal breeding in that country by testing new varieties and promoting the production of breeder's seed. This entails conducting field activities, renovating machinery and equipment, and training NARS staff.
- A **project funded by the International Development Fund (IDF) of the the World Bank** in Kazakhstan is focusing on developing the national strategies for reforming the agricultural research system and building up NARS research capacities. It is also testing different agronomy options (seeding rates, sowing dates, fertilizer) on both spring and winter wheat in the northern and southern regions of the country.



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