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# **COSTS OF RESTRICTIVE POLICIES ON INTRODUCTION OF NEW SEED VARIETIES IN IRAQ**

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# Table of content

EXCECUTIVE SUMMARY .....	- 1 -
BACKGROUND .....	- 3 -
The Example of Brazil .....	- 4 -
The Situation in Iraq.....	- 5 -
Seed Potato Case Study.....	- 6 -
Real Costs of Restricting Imports of Seed and Other Planting Materials.....	- 7 -

# EXECUTIVE SUMMARY

New seed varieties and improved planting materials are the life blood of modern agriculture. As demonstrated by the green revolution<sup>1</sup> new varieties are not only the driving force behind dramatic increases in productivity of land and labor, but also a powerful tool to create added value that increases rural incomes and moderates consumer foodstuff prices. New varieties produce higher quality products, improve specific agronomic traits in line with consumer preferences, and can extend the harvest season, taking advantage of early and off season higher price windows. This paper analyzes the current restrictive Government of Iraq (GoI) policies related to certification and release of new varieties of seeds and improved planting materials, and the implications thereof for improved productivity and competitiveness of the agricultural sector. It also estimates costs of these restrictive policies in terms of “missed opportunities” for sustainable socio-economic development of the sector.

Iraqi procedures for introduction of new field crop varieties are burdensome, costly and time consuming. Registration and release of a new variety requires at least two years of field trials supervised by the Seed Testing and Certification Board, with an up-front “registration” fee ranging from \$2,000 to \$3,700. These time and financial cost factors strongly discourage introduction of imported foreign-certified varieties. Even more damaging is the resulting lack of competition in the national market supplying seeds and planting materials to producers. Restricted competition creates a price-inflated national market for these critical inputs, which discourages producers from adopting new more productive varieties.

The potato case study discussed below provides one example of how current Iraqi policies on introduction of new varieties of seeds and improved planting materials may have the opposite of the intended effect. Instead of protecting Iraqi producers from imports of low quality or impure seeds, these policies severely limit their access to modern planting inputs. In consequence, not only are producers foreclosed from opportunities to enhance productivity and incomes, but agribusinesses throughout the agricultural input supply and output marketing value chains are negatively impacted. Input supply businesses are excluded from a potentially profitable line of business in importing, multiplying and distributing modern varieties of foreign certified seeds and planting materials. Similarly, output marketing agribusinesses cannot benefit from expanded marketing windows resulting from a longer harvest season, from higher prices because of increased product quality or from marketing increased product volumes. Likewise, neither producers nor marketers can benefit from adoption of improved varieties with specific agronomic traits that command a higher price or satisfy a special

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<sup>1</sup> The “green revolution” during the 1960s and 1970s greatly increased world production of cereals such as wheat and rice, primarily through widespread availability of better seed and other planting materials, complemented by improved cultural practices. This resulted in greatly increased worldwide availability of food and confounded predictions of looming widespread famine.. Source: The American Heritage® New Dictionary of Cultural Literacy.

niche in the marketplace. As a result Iraqi agriculture remains largely uncompetitive with other countries, such as Syria, Iran, and Turkey, which do not have such restrictive policies, exporting to Iraq. In the absence of such restrictions, these competitors have higher productivity, produce better quality, and offer more varieties on a year-round basis, or for an extended season.

The USAID-*Inma* technical team and many other knowledgeable observers consider current Iraqi seed and planting material policies to be not only a serious constraint to development of a competitive and sustainable agricultural production subsector in Iraq, but also to constrain development of a competitive food-processing industry. Costs of these policies to agribusinesses in Iraq in terms of “missed opportunities” have been estimated to be \$1 billion per year.

An alternative to in-country testing of each variety introduced is an approach that is widely used in other countries. Under this alternative, no import restrictions would apply to seed varieties and other planting materials certified by internationally recognized organizations such as the “Organization for Economic Cooperation and Development (OECD)” or the “Central Administration for Seed Certification and Testing (CASC)”. The Iraqi Ministry of Agriculture (MoA) could greatly expand access to the latest globally available seed varieties and improved planting materials by accepting certifications from recognized international institutions. This would be a far-reaching “no-cost” means for improving Iraqi agricultural productivity, output and incomes, as well as for significantly enhancing national food security.

Unless major changes are made to current policies governing introduction, multiplication and release of new seed varieties and improved planting materials, Iraqi agriculture will remain uncompetitive with imports, and agricultural sector stagnation will continue.

# BACKGROUND

Agriculture is the backbone of the economies and the major source of employment in most developing countries. Agriculture's share of the gross domestic product (GDP) is often more than 50 percent. In some developing countries up to 80 percent of the population earn their living in agriculture. Although the agricultural production subsector in Iraq contributes only an estimated 12% of the GDP<sup>2</sup>, economic activities throughout the entire agricultural value chain are by far the most labor intensive, employing more than half of the active labor force. However, in Iraq, as in many developing countries, agricultural productivity is extremely low, with unstable and low yields. A large share of Iraqi agricultural activity is subsistence farming, generating little cash income, and, in many cases, subsistence family production is insufficient to feed them. Under those circumstances, the agricultural sector is unable to contribute to the country's overall economic development and is neither competitive nor sustainable.

A major factor contributing to poor agricultural performance in Iraq during the last few decades has been failure to introduce significant new seed varieties and improved planting materials. If Iraqi agriculture is to become competitive with imported agriculture products and provide a sustainable income for rural populations, the GOI must adopt enabling policies that facilitate introduction and in-country multiplication of improved seed varieties and planting materials, while also encouraging increased public and private investment in the seed and planting materials subsectors.

If economic and social development is to occur in rural Iraq, the GOI must adopt and implement a predictable, reliable, user-friendly and affordable regulatory environment to ensure that farmers have access to high quality seed and other planting materials at a competitive price. In particular, Iraq is urged to embrace and participate fully in the internationally harmonized systems of the Organization for Economic Cooperation and Development (OECD), the International Union for the Protection of New Varieties of Plants (UPOV), the International Treaty on Plant and Genetic Resources for Food and Agriculture (ITPGRFA), the International Seed Testing Association (ISTA) and the Central Administration for Seed Certification and Testing (CASC). Full participation in these systems will facilitate the in-country availability of germplasm, new well-tested plant varieties, and high quality certified seed and other plant materials for the benefit of Iraqi producers. Without such participation, the ability of Iraqi producers to respond to the competitive challenges ahead is substantially impaired.

Improved varieties and high quality seeds and plant materials are basic requirements for productive agriculture. Through the efforts of both the public and private sectors, plant breeding and seed production have provided an enormous contribution to global agriculture in terms of yield, resistance to biotic and abiotic stresses, resistance to pests

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<sup>2</sup> Source: US Department of State, 2010. If the hydrocarbons sector is excluded from GDP, the entire agricultural value chain (production, plus upstream and downstream agriculture-related value added activity) is estimated to generate more than 40% of (non-oil) GDP

and diseases, harvest security, and other desirable agronomic traits, such as increased nutritional value and maturity duration.

Over the past two decades, widespread acceptance of internationally recognized authentication for varietal certification, phytosanitary specifications and laboratory testing has greatly facilitated development of the international seed trade. The global seed market has grown rapidly in recent years and currently is estimated at US\$50 billion, with Europe, North America and Asia accounting for almost four-fifths of this trade.

## The Example of Brazil<sup>3</sup>

Brazil provides an impressive example of how modern plant breeding and facilitating availability of new improved varieties can revolutionize agriculture. In less than thirty years Brazil has turned itself from a net food importer into one of the world's great exporting breadbaskets, rivaling traditional grain exporters such as the USA, Canada, Australia, Russia and Argentina. In the years between 1997 and 2007 the total value of crops produced in the country jumped from US\$13 billion to US\$65 billion. According to the Brazil National Center for Horticultural Research the production of vegetables doubled between the years 1980 and 2005. Since 1996 Brazilian farmers have increased the amount of land under cultivation by a third, mostly in the so called "cerrado" region,<sup>4</sup> a vast tropical savanna previously regarded as unfit for farming due to acidic and nutrient-poor soils.

More importantly, and no less astonishingly, Brazil has accomplished all of this without significant government subsidies. According to the Organization for Economic Co-operation and Development (OECD), state support accounted for 5.7% of the total farm income in Brazil during 2005-2007. That compares with 12% in USA, 26% for OECD as an average, and 29% in the European Union. The availability of abundant water and previously under-utilized farmland, although important, is a secondary reason for this achievement. The primary reason according to Embrapa, the Brazilian Research Agency for Agriculture, was a relentless effort in pursuit of modern plant breeding and development of new crop varieties.

Embrapa researchers developed varieties of legumes that work especially well in the acidic soils of the cerrado region when inoculated with *rhizobium*, a bacterium that helps fix nitrogen in legumes, thus reducing the need for fertilizers. Another example of new crop development is the spectacular increase of forage production. Embrapa patiently crossbred an African forage grass called *brachiaria*, and eventually developed a new

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<sup>3</sup> Data and facts extracted from Embrapa site ([www.embrapa.gov.br](http://www.embrapa.gov.br)) and "The Economist Intelligence Unit, 2010".

<sup>4</sup> The "cerrado" region is characterized by a hot semi-humid climate with pronounced seasonality marked by a dry winter season from May to October, and with annual rainfall around 800mm. The soils are generally very old, deep, and by nature nutrient-poor.

variety called *braquiarinha* which produces 20 to 25 tons of grass feed per hectare, many times what the native cerrado grass could produce and three times the yield of the African parent grass. No less remarkable is the leap in production of soybeans. Embrapa converted soybeans to a tropical crop. Soybeans are native to north-east Asia, a temperate climate. They are sensitive to temperature change and require seasonal day-length and temperature changes for proper growth and maturing. Through old-fashioned crossbreeding, Embrapa developed varieties suitable to the tropical climate. Researchers also developed soybean varieties more tolerant of acid soils, as well as “short cycle” varieties, allowing production of two crops each year.

## The Situation in Iraq

In terms of seed varieties and genetic improvements, Iraq’s agriculture suffers from nearly two decades of state command and control and isolation from the rest of the world. Varieties currently planted for the main crops of wheat, barley, cotton, corn, and rice date back many years. The practice of saving seeds for the next planting season, which results in progressive varietal degradation, is still widespread in the country, especially among small subsistence farmers who account for most of the agricultural production in Iraq.<sup>5</sup> There has been very little genetic improvement in grain seed or vegetable seed in Iraq over the last twenty years.

The MoA National Committee for Registration, Releasing & Protection of Agriculture Varieties (NCCRRPV) is the body responsible for seed certification in Iraq. This Committee requires that field testing and laboratory analysis take place in Iraq for each new variety of seed before it can be released to farmers. Introduction of new field crop varieties requires a minimum of two years of field trials by the Seed Testing and Certification Board ostensibly to determine the suitability of the variety for Iraqi growing conditions.<sup>6</sup> Moreover, each new variety must be registered with the MoA. Each registration has a cost ranging from \$2,000 to \$3,700. This policy discourages the introduction of imported foreign varieties and severely limits the diversity of commercial varieties legally available in Iraq.

GOI enterprises, along with a few private companies, are the main sources of commercial wheat and barley seed.<sup>7</sup> Only a few private companies monopolize the legal

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<sup>5</sup> According to the data provided in 2009 by the Agricultural Research Center in Abu Ghraib, seed saved by farmers accounted for almost 80% of the seed market for wheat, 93% for Barley, 95% for rice and 82% for corn.

<sup>6</sup> Procedures for variety registration and release are as follows: prior to registration, breeders submit the description and agronomic performance of the variety. Breeders must plant the variety on an area not less than one hectare in at least three locations in the target region, and in one or more locations in the farmers’ fields. The NCCRRPV appoints a technical committee that visits these variety trials at least twice before submitting a final report.

<sup>7</sup> Commercial seeds are defined as bought in the market, as opposed to seeds that farmers produce and save for their own use.

import of vegetable seeds and fruit tree seedlings, the result of a regime of controlled licensing for seed and seedling importation.

Current Iraqi policy on seeds not only slows down introduction of new varieties developed by international research organizations such as CYMMIT<sup>8</sup>, ICARDA<sup>9</sup>, or IRRRI<sup>10</sup>, but also discourages the introduction of imported foreign certified varieties. This in turn severely limits competition in the seed supply market. Restricted competition creates a price-inflated domestic market for seeds that discourages farmers from adopting the use of improved seeds.

The following section presents results of a study by the USAID-*Inma* Agribusiness Program that analyzed the consequences of limited competition in the supply of planting materials for Iraqi potato production.

## Seed Potato Case Study

According to “*Iraq Households Socio Economic Survey IHSES-2007*”, Iraqis consumed almost 700,000MT of potatoes in 2007. In 2009, total consumption, including the food service sector, was estimated at 900,000MT. Data collected from wholesalers in the Kurdistan region and in Central and Southern Iraq show that 90 to 95% of the potatoes purchased are imported from neighboring countries. In 2010 the MoA estimated that Iraq had only 3,000 hectares planted to potatoes as opposed to 45,000 hectares in 2006 and 51,000 hectares in 2005.<sup>11</sup>

Iraqi vegetable production is increasingly skewed toward a few summer vegetables such as tomatoes, cucumbers and eggplants. Unable to compete with imports from Iran and Syria, Iraqi potato production has declined precipitously during the past few years. The potato industry in Iraq currently is in a vicious downward spiral with farmers saving and using poor quality seed potatoes because of the high cost of improved, better quality imported seed potatoes. This has resulted in current yields ranging from 15 to 20MT/ha at a production cost of \$0.29 to \$0.33 per kg. With farm gate prices ranging from \$0.25 to 0.29/kg, most farmers sell their potatoes at a loss. In order to be competitive with lower priced imports from Iran, Syria and Saudi Arabia, Iraqi potato producers must increase yields to at least 40MT/ha, a level of productivity that can only be achieved with high quality seed potatoes.

The current high cost for seed potatoes in Iraq, as much as \$1,500/MT, which well above the international market price of \$500/MT, hampers recuperation of Iraqi potato production. A significant reduction in the cost of seed potatoes is only possible in a

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<sup>8</sup> International Maize and Wheat Improvement Center

<sup>9</sup> International Center for Research in Dry Areas

<sup>10</sup> International Rice Research Institute

<sup>11</sup> COMIT Agricultural Census 2006, last census available. Also Iraq Agricultural Statistics Yearbook 2005, showing 51,000 ha planted with potatoes.

more competitive market. Effective competition is not currently possible because the market is controlled by only a few companies licensed to import a limited number of varieties of seed potatoes registered with the MoA.

## Real Costs of Restricting Imports of Seed and Other Planting Materials

Restrictive policies on imports of seeds and other improved planting materials currently in place in Iraq affect productivity of the overall agribusiness sector, as well as capacity of national agriculture to compete with imported products. The most widely acknowledged impact is on cereal productivity that lags well behind international averages. This can be attributed mainly to poor quality seed used by farmers to plant wheat, barley, corn and rice. Field demonstrations supported by the USAID-*Inma* Agribusiness Program show that by using higher quality seed, wheat and barley yields can be raised by 0.5MT/ha, and corn yields can be raised by 2.0MT/ha; all other cultural practices remaining unchanged. If these productivity gains were achieved throughout Iraq, grain farmers would increase their incomes by an estimated \$265 million at current market prices.<sup>12</sup> Adoption of high gluten wheat varieties of seed will expand production of the more valuable grade #1 wheat, thereby adding another \$40 million to producer incomes.<sup>13</sup>

Current policies related to registration, multiplication and release of new seed varieties have even more far-reaching negative consequences for horticultural production. The scarcity of modern certified seed varieties in the Iraqi farm input supply market (because of onerous GoI registration and release policies) not only reduces productivity but also negatively affects the ability of farmers to extend the length of the harvest season. This forecloses adoption of varieties with specific “premium-price” agronomic traits that could create additional value for farmers. The negative impacts of these policies vary from crop to crop, but have a more negative effect on crops such as potatoes, where seed costs are a high percentage of total costs of production. The potato study shows that with a more internationally competitive price for seed potatoes in the national marketplace, Iraq could produce a minimum of 400,000MT of potatoes each year, substituting imports with Iraqi production for an overall value of approximately \$100 million.<sup>14</sup>

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<sup>12</sup> Based on a projected increase in yields of 0.5MT in 800,000 hectares of wheat, 0.5MT on 200,000 hectares of barley, and 2.0MT on 30,000 hectares of corn, with average value of \$400/MT

<sup>13</sup> MoA estimates high gluten grade #1 wheat only accounts for 12 to 15% of total wheat production in Iraq. Typically grade #1 wheat commands a premium price of +30% (\$135) as compared to lower grades; based on a projected increase in grade #1 of 300,000MT x \$135.

<sup>14</sup> Based on a projected increase of domestic production of 400,000MT at a price of \$250/MT

The lack of quality seeds also negatively affects the production of summer vegetables in Iraq. Current production is estimated by the MoA to be 1.5 million MT per year. USAID-*Inma* field trials demonstrated that the adoption of quality seeds in summer vegetable production could lead to gains in yields of as much as 8MT/ha; all other practices being equal. Such a gain in average productivity would add an estimated \$205 to the current summer vegetable output.<sup>15</sup>

Current restrictions on introduction of new varieties limit the length of the harvest season and limits quality and marketability of fruits and vegetables. Iraqi farmers currently suffer from a short harvest-time window with a glut of produce arriving in the market during a short peak-harvest period, causing prices to fall and producers to receive depressed prices at the farm gate and reducing margins for wholesalers and retailers. This is exacerbated by the absence of early and late season maturing seed varieties in Iraq (although available internationally), which would extend the harvest season. The USAID-*Inma* technical team estimates that with the introduction of new early and late maturing varieties, the harvest season for most fruits and vegetables produced in Iraq could be extended by at least one month, generating an import substitution value-added of approximately \$130 million per year.<sup>16</sup>

Better varieties of vegetables and fruits not only increase productivity but also can offer differentiated vegetables and fruits with desirable traits, for which consumers are willing to pay a premium price. For example, the USAID-*Inma* program has documented a price of \$0.60/kg paid at the farm gate for recently introduced seedless table grapes compared to \$0.40/kg paid for ordinary grapes (a 50% premium). Data on fruit and vegetable markets in the Middle East show premium price niche markets for varieties with specific agronomic traits much appreciated by consumers. These premium priced fruits and vegetables may account for as much as 20% of total consumption. Translated to Iraq, these niche opportunities for replacing currently imported premium value fruits and vegetables with locally grown products could generate an import substitution value-adding of an estimated \$120 million per year.<sup>17</sup>

Furthermore, restrictive policies on introduction of new varieties have consequences not only for production agriculture but also for processing segments of Iraqi agricultural value chains. In fact some of the most important processing sectors worldwide, such as tomato paste, depend heavily on availability of special varieties with specific characteristics better suited for processing. A The USAID-*Inma* Program study found that lack of a competitive tomato paste industry in Iraq is at least in part due to the absence of appropriate tomato varieties in-country, such as varieties with high soluble solids which are more suitable for profitable tomato paste processing.<sup>18</sup>

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<sup>15</sup> Iron Horse Program, quarter4-2007 and Wassit Tomato Trial Program, June 2008 – March 2009. Based on estimates of 100,000 hectares x 8.0MT (increased yields) x \$255/MT.

<sup>16</sup> Based on an estimated additional production of 500,000MT X \$255/MT

<sup>17</sup> Based on an estimated 100,000MT (20% of current production) x \$600/MT

<sup>18</sup> Major tomato paste exporters, such as China, Spain, Italy and Iran commonly use specific varieties with “Total Soluble Solids” around 6% or higher, meaning they can produce 1 kg of tomato paste with only 5.0 kg of tomatoes, as opposed to Iraq that uses double purpose varieties

In conclusion, unless far-reaching changes are made in current policies governing introduction, multiplication and release of new seed varieties and of other improved planting materials, Iraqi agriculture will continue to be non-competitive with cheaper, better quality and more differentiated products available year-round from exporting countries.

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suitable primarily for table production, where 6.0 to 6.5 kg of raw material generally is required for 1 kg of paste.