

Government Support in Mexican Agriculture: The Agri-Food Productivity and Competitiveness Program¹

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Introduction

Mexico is the largest source of agricultural imports to the United States. Imports from Mexico, especially fruit and vegetable imports, have seen rapid growth in recent years. Major commodities include tomatoes (Guan et al. 2018; Wu et al. 2018b; Li et al. 2021), peppers (Biswas et al. 2018), berries (Suh et al. 2017; Wu and Guan 2021), and cucumbers and squash. The value of fresh fruit and vegetables imported from Mexico to the United States reached \$14 billion USD in 2020, more than double the value in 2010 and higher than the amount imported from the rest of the world combined (USDA-FAS 2021). In comparison, the combined US exports of corn and soybeans, the two largest agricultural commodities exported to Mexico, were \$4.6 billion in 2020 (USDA-FAS 2021). Fruit and vegetable production, especially protected production such as production under greenhouse structures, requires large investment in technology. For producers in developing countries, capital usually is the major bottleneck that could limit the potential of their competitive advantages in labor. To help alleviate the capital constraint, the Mexican government has provided generous support over the years (Victoria et al. 2011; Wu et al. 2018a). Wu et al. (2018a) showed that the Mexican government has consistently promoted protected production through subsidies since 2001. This support has accelerated the development and rise of Mexico's fruit and

vegetable industry in the global market. In 2018, Mexico had about 40,000 acres of fresh tomato production under protection structures, while Florida, the largest tomato producer in the United States and the major competitor of Mexican produce in the US market in general, had only 29,000 acres of fresh tomato production, almost all open-field (SIAP 2020; USDA-NASS 2020). Compared to open-field production, protected production has many advantages, including higher yield, better crop quality, extended production season, and improved market access. For example, Mexican protected tomato yield is four times higher than Florida tomato yield. These advantages have contributed to a more competitive position of the Mexican fruit and vegetable industry in the market.

Mexico's agricultural subsidy programs are administered by the Secretariat of Agriculture and Rural Development (SADER) under the "National Development Plan" to boost the productivity and competitiveness of the Mexican agri-food sector and mitigate uncertainties in agri-food activities. These programs provide subsidies to individual producers and companies to support economic activities (such as production, postharvest management, and marketing) in the agri-food supply chain (Wu et al. 2018a).

1. This document is FE1107, one of a series of the Food and Resource Economics Department, UF/IFAS Extension. Original publication date December 2021. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.
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Under the 2013–2018 National Plan (SADER 2014; 2015; 2016; 2017; 2018), eleven federal programs were established to improve the productivity and competitiveness of Mexico's agri-food sector:

1. Marketing and Market Development Program
2. Federal Agency Actions
3. **Agri-food Productivity and Competitiveness Program**
4. Agricultural Promotion Program
5. Agri-food Safety and Health Program
6. Comprehensive Rural Development Program
7. Fishery and Aquaculture Productivity Promotion Program
8. Support Fund of Productive Projects in Agricultural Areas
9. Livestock Development Program
10. Entrepreneurial Women Productivity Support Program
11. Innovation, Research, Technological Development, and Education Program

As one of a series of analyses focusing on governmental support in Mexican agriculture, this publication aims to provide industry stakeholders and policymakers with an overview of the Agri-Food Productivity and Competitiveness Program (AFPCP). We will present the rules and subsidies of the subprograms with a focus on those relevant for fruit and vegetable commodities. A previous study (Wu et al. 2018a) focuses on the Agricultural Promotion Program, Mexico's largest agricultural subsidy program.

Agri-Food Productivity and Competitiveness Program

The overall objective of the AFPCP is to boost productivity in the agri-food sector through investing in physical infrastructure, human capital, and technology to ensure food security. Mexico's agricultural subsidy expenditure under the AFPCP in 2018 was 11.9 billion pesos (US\$618 million), almost four times higher compared to 3.2 billion pesos (US\$240 million) in 2014 (data incomplete). The average over 2014–2018 was 9.5 billion pesos (US\$538 million) per year, and the total amount under this program over the period was 47 billion pesos (US\$2.7 billion) based

on data available (Table 1). The fruit and vegetable industry received 3.3 billion pesos (US\$199 million) over the period from 2014 to 2018.

There have been changes in the structure and composition of the AFPCP since 2014. Specifically, the subprograms that provided support to Mexico's fruit and vegetable industry are: 1) Access to Financing; 2) Agri-Food Certification and Standardization; 3) Agri-Food Productivity; 4) National System of Agroparks; 5) Strengthening the Production Chain; and 6) South-Southeast Productive Development.

Access to Financing

Access to financing is the largest subprogram and contained five components in 2014: 1) guarantee service; 2) reduction of financing costs; 3) insurance premium subsidies; 4) subsidies to establish risk capital; and 5) other schemes. Table 2 lists the support rules of these five components. During 2015–2018, only two components, guarantee service and reduction of financing costs, were in this subprogram.

The subsidies in the *guarantee service* component aim to expand timely access to competitive financing for producers in the agri-food sector through a guaranteed service that fulfills a loan. The Mexican government subsidizes up to 100% of the outstanding balance on the loan. The *reduction of financing costs* component is granted to reduce the interest rate of loans, with a maximum reduction of rate up to 4 percentage points (Table 2).

Table 3 reports total subsidies relevant to fruit and vegetables. Supports for the fruit and vegetable industry under this subprogram were 391 million pesos (US\$25 million) in 2015, 77 million pesos (US\$4 million) in 2016, and 219 million pesos (US\$12 million) in 2017 (Table 3). Data for this subprogram are unavailable for 2014 and 2018.

Agri-Food Certification and Standardization

This subprogram promotes the certification, accreditation, verification, and/or testing of organic products, as well as the labeling and use of the National Distinction of Organic Products to boost their competitiveness in the national and international markets. The productivity and profitability of the organic production system in Mexico was consolidated under this subprogram. Table 4 presents the support rules. Table 3 shows that 18 million pesos (US\$1 million) and 4 million pesos (US\$0.2 million) were given to fruit and vegetable crops in 2016 and 2017, respectively.

Agri-Food Productivity

This subprogram provides subsidies to expand and modernize the capacity for processing and handling agricultural and fishery products. It encourages the increase in the scale of production to improve postharvest management with subsidized infrastructure and equipment. The support rules are presented in Table 5. For example, the Mexican government subsidized 50% of the investment value, up to 10 million pesos (US\$0.8 million) per project for postharvest infrastructure and equipment. The total investment amounts of the projects relevant to fruit and vegetables under this subprogram were 575 million pesos (US\$43 million) in 2014, 347 million pesos (US\$22 million) in 2015, 134 million pesos (US\$7 million) in 2016, and 111 million pesos (US\$6 million) in 2017 (Table 2).

National System of Agroparks

Incentives under this program are allocated to develop and promote a National System of Agroparks. An agropark is a high-tech greenhouse cluster that provides space for companies to grow specialized products for export using state-of-the-art technology. Table 6 lists the rules that need to be followed to receive the subsidy. For example, for equipment installed in the agroparks, the government provided incentives up to 50% of the total investment, capping total support at 100 million pesos (US\$7.5 million) per agropark. Support for the fruit and vegetable industry under this subprogram was 40 million pesos (US\$2.1 million) in 2016 and 30 million pesos (US\$1.6 million) in 2017.

Strengthening the Production Chain

This subprogram aims to integrate economic agents (producers and buyers) of the rural sector into the production chain through promoting the use of market risk management instruments to increase their income stability. Market risk management instruments include forward contracts and derivative financial products (e.g., futures and options). The former is commonly used in the fruit and vegetable industry. The support amounts and rules are presented in Tables 3 and 7, respectively. For producers who sign the purchase and sale agreement, the government will subsidize up to 100% of the option premium for producers and up to 50% for buyers. The majority of the subsidies in this subprogram went to the livestock and grain industries for the 2014–2018 period. Support for the fruit and vegetable industry is available only for the years 2016 and 2017. Subsidies were provided to the citrus industry both years, totaling 35 million pesos (US\$1.9 million) and 15 million pesos (US\$0.8 million) in 2016 and 2017, respectively.

South-Southeast Productive Development

This subprogram promotes agriculture, fishing, and aquaculture in the South-Southeast area of Mexico. In 2014, this area included the states of Campeche, Chiapas, Guerrero, Morelos, Oaxaca, Puebla, Quintana Roo, Tabasco, Veracruz, and Yucatán. Michoacan was added in the coverage of this subprogram in 2016. This subprogram contains two components—finance incentives and strengthening productivity. The component of finance incentives seeks to provide incentives for agricultural production with credit granted through development banks. Eligible projects may be financed by national or foreign financial institutions, public and private funding agencies, and other financial entities. The support amount varies across applicants with different monthly income levels, whereby individuals with lower monthly income levels can receive more support. The component of strengthening productivity intends to encourage technology development, training, and product certification. The support rules are shown in Table 8.

Because South-Southeast Mexico was an underdeveloped area, the Mexican government set up this program specifically for this area and provided large amounts of support. For example, the average support under this subprogram during 2016–2018 was about 1.9 billion pesos (US\$107 million), accounting for 16% of the total program (AFPCP) expenditure. The total subsidy amount allocated to the fruit and vegetable industry over 2014–2018 was 1.3 billion pesos (US\$73 million), or an average of 266 million (US\$15 million) pesos per year.

Summary

The Mexican government has a comprehensive agricultural support program. This article focused on the Agri-Food Productivity and Competitiveness Program, one of the largest programs that provide support to the fruit and vegetable industry. This program aims to: 1) improve producers' access to financing, 2) increase productivity and expand the economies of scale through investing in equipment and infrastructure, 3) generate greater added value with the certification and standardization process, and 4) reduce the risk in agri-food activities by promoting the use of risk management tools.

The program subsidizes various economic activities in the supply chain of the Mexican fruit and vegetable industry. The total amount of subsidies to the fruit and vegetable industry under this program over 2014–2018 was at least 3.3 billion pesos (US\$199 million) based on available data (Table 1). The two largest crops, citrus and tomatoes, received a total amount of 772 million pesos (US\$47 million)

over the period, accounting for 23% of the subsidies to the fruit and vegetable industry under this program. These subsidies, along with those from other programs under the National Development Plan (Wu et al. 2018a), have cultivated, advanced, and accelerated the development of a competitive supply chain in the fruit and vegetable industry in Mexico. Rapidly growing fruit and vegetable production in Mexico has increased competition in the US produce market, including tomatoes (Guan et al. 2018; Wu et al. 2018b; Li et al. 2021), berries (Suh et al. 2017; Wu and Guan 2021), and peppers (Biswas et al. 2018).

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Table 1. Program subsidies for the fruit and vegetable industry, 2014–2018 (1,000 pesos).

	2014	2015	2016	2017	2018	Total in 1000 Pesos	Total in 1000 USD
AFPCP	3,189,289	10,500,774	10,387,346	11,559,786	11,891,571	47,528,766	2,690,261
Fruit & Veg.	684,289	814,645	600,315	546,976	678,058	3,324,283	199,329
Citrus	83,017	42,083	159,551	42,380	109,794	436,825	25,394
Tomato	107,255	94,856	35,884	95,211	1,720	334,926	21,112

Source: SADER (2014; 2015; 2016; 2017; 2018).

Table 2. Support rules of the Access to Financing Subprogram, 2014.

Components	Maximum Support Amount (pesos)
Guarantee service	Up to 100% of the unpaid credit balance
Reduction of financing costs	Up to four percentage points in the reduction of the interest rate authorized in the credit contract
	Up to 50% of the cost of the premium of the guarantee service
Insurance premium subsidies	Up to 60% of the insurance premium charged to producers
Subsidies to establish risk capital	Up to 35% of the investment value
Other schemes	Benefit to producers through schemes related to financing and risk management

Source: SADER (2014).

Table 3. Support by Subprograms for the Fruit and Vegetable Industry, 2014–2018 (1,000 pesos).

	2014	2015	2016	2017	2018
Access to Financing	N/A	391,190	77,493	219,396	N/A
Agri-Food Certification and Standardization	N/A	N/A	17,508	3,992	N/A
Agri-Food Productivity	574,922	346,525	134,123	110,700	N/A
National System of Agroparks	N/A	N/A	40,000	30,000	N/A
Strengthening the Production Chain	N/A	N/A	34,595	15,276	N/A
South-Southeast Productive Development	109,367	76,929	296,595	167,611	678,058

Source: SADER (2014; 2015; 2016; 2017; 2018). N/A denotes data “not available.”

Table 4. Support Rules of the Certification and Agri-Food Standardization Subprogram, 2014.

Components	Maximum Support Amounts (pesos)
Organic conversion training and implementation	50% of the total cost of the training or up to \$240,000 pesos per request. For areas of high and very high marginalization, 75% or up to \$300,000 pesos of the total cost of the application.
Creation of the organic production plan	50% of the total cost of technical assistance or up to \$ 80,000 pesos per request. For areas of high and very high marginalization, 75% or up to \$100,000 pesos of the total cost of the application.
Organic inputs	50% of the total cost of supplies or up to \$200,000 pesos per request.
Organic certification	50% of the total cost of the certification or up to \$80,000 pesos per application. For areas of high and very high marginalization, 75% or up to \$100,000 pesos of the total cost of the application.
Verification	50% of the total cost of the accreditation or up to \$ 250,000 pesos for Conformity Assessment Agents.
Printing and labeling of the National Emblem for Organic Products	50% of the total cost of printing and/or labeling or up to \$100,000 pesos of the total cost of the application for the National Distinction of Organic Products.

Source: SADER (2014).

Table 5. Support Rules of the Agri-Food Productivity Subprogram, 2014.

Components	Maximum Support Amounts (pesos)
Infrastructure and equipment in postharvest	Up to 50% of total investment, not exceeding \$10,000,000 per project
Infrastructure and equipment in postharvest of new association schemes, in municipalities included in the National System for the Crusade against Hunger, in priority areas of the South-Southeast area or in municipalities with high and very high rates of poverty throughout the country	Up to 70% of total investment, not exceeding \$5,000,000 per project
Infrastructure and equipment for local governmental sanitary inspections	Up to 50% of total investment, not exceeding \$20,000,000 per project
Infrastructure and equipment for High Impact Comprehensive Projects	Up to 50% of total investment, not exceeding \$30,000,000 per project
Laboratory equipment for health, safety, and quality	Up to 50% of total investment, not exceeding \$2,000,000 of the project
Infrastructure and equipment for food collection	Up to 50% of investment per food bank, without exceeding \$12,000,000 per project
Technical assistance and/or business support	Up to 5% of total incentive, not exceeding \$300,000 per project

Source: SADER (2014).

Table 6. Support Rules of the National System of Agroparks Subprogram, 2014.

Components	Maximum Support Amounts (pesos)
Evaluate and/or implement projects	Up to 70% of cost, not exceeding \$5,000,000 per evaluation and/or project per agropark
Comprehensive development of agroparks	Up to 50% of total investment by agropark, not exceeding \$250,000,000
Equipment of agribusinesses installed in agroparks	Up to 50% of total investment, not exceeding \$100,000,000 by agropark Up to \$10,000,000 per agribusiness installed within agropark
Business support	Up to 5% of total incentive, not exceeding \$2,000,000

Source: SADER (2014).

Table 7. Support Rules of the Strengthening the Productive Chain Subprogram, 2014.

Components	Maximum Support Amount (pesos)
With a Purchase-Sale Agreement	
1. Incentive for producer: a. Cost of coverage b. Commission for service of purchase and administration coverage	1.a. Up to 100% of coverage cost 1.b. Up to the equivalent of US\$8 of commission
2. Incentive for buyer a. Cost of coverage purchased by buyer b. Cost of coverage purchased by producer if buyer does not purchase coverage	2.a. Up to 50% of coverage cost 2.b. Up to 50% of coverage cost purchased by producer
3. Incentive for producer or buyer for basis compensation	If the difference between the final basis and the initial basis is positive, the incentive will be delivered to the producer, and if it is negative, to the buyer.
Without a Forward Purchase-Sale Agreement	
Incentive for producer/buyer for cost of coverage	Up to 50% of coverage cost

Source: SADER (2014).

Table 8. Support Rules of the South-Southeast Productive Development Subprogram, 2014.

Components	Maximum Support Amounts (pesos)
Finance Incentives	
Financing (Applicants A)	Up to 30% of total project cost, not exceeding \$8,000,000
Financing (Applicants A & B)	Up to 50% of total project cost, not exceeding \$15,000,000
Financing (Applicants B)	Up to 50% of total project cost, not exceeding \$15,000,000 Up to 70% of total project cost, not exceeding \$15,000,000, when project is located in areas of high and very high marginalization
Strengthening Productivity	
Technological development	For A : 30–50% of total project cost For B : p to 90% of total project cost
Technical assistance and specialized training	Up to 100% of total project cost in the first year, reducing up to 30% in the third year
Direct incentives, without financing, for reactivation of production, including infrastructure and equipment	For A : Up to 30% of total project cost, not exceeding \$8,000,000 For A&B : Up to 50% of total project cost, not exceeding \$15,000,000 For B : Up to 50% of total project cost, not exceeding \$15,000,000 Up to 70% of total project cost, not exceeding \$15,000,000, when project is located in areas with high and very high marginalization
Certification in good production practices for conventional honey and organic honey	\$2,000 per apiary
Applicants A are individuals with a monthly income level above the decile of IX, as defined by INEGI (National Institution of Statistics of Mexico), while Applicants B are individuals with a monthly income level within deciles of I to IX. Source: SADER (2014).	