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TRAINING NETWORKS FOR ADAPTING TO THE AGRICULTURAL SYSTEM: LATINO BLUEBERRY FARMERS IN THE UNITED STATES

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ABSTRACT

The case of how the participation of a group of agricultural producers of Mexican origin located in south western Michigan in a project which sought to transfer knowledge turned into a network in which Latino agricultural specialists were incorporated and how they were able to transmit useful knowledge and counselling on growing blueberries to the producers. The process of building this network lets us see how much the programs, projects, financing, actions and adoption of technological packages and knowledge for successfully growing and selling blueberries also became a tool which favoured the incorporation of these producers into the necessary practices within the American agricultural system. Up to the present, the project has allowed the Mexican producers to develop certain administrative and control skills, which in some cases, have had a bearing on their obtaining subsidies which are offered to newly arrived producers in the sector. They have also improved agricultural management and have learned the specifications for growing blueberries.

Keywords: Knowledge, Latinos farmers, networks, agricultural skills.

INTRODUCTION

In the state of Michigan (US) agricultural activity is second in importance only to the automotive industry. According to the 2012 agricultural census, 300 agricultural products generated an average of \$96 billion dollars annually, which places the state second (only behind California) in agricultural diversity. This activity accounts for 22% of the jobs in the state, equivalent to 923,000 jobs. Michigan has about 9,948,564 acres of cultivable land, divided into 52,194 farms with an average size of 191 acres each. Furthermore, the state leads the nation in the production of 18 commodities and ranks in the top 10 of 56 other commodities. (USDA-NASS census 2012).

According to the same census, Latinos run 855 of these farms. The total cultivable surface of these producers is over 115,087 acres and the average size of their farms is 135 acres. These new producers have no background in the agricultural sector (they were not farm workers), nor in handling the business administration necessary to

operate a commercial farm.¹ However, as suggested by Martínez (2011), these producers have an advantage in that they belong to a network mediated by their ethnic identity, in which they may find the information needed to get a job or find self-employment (Patacchini and Zenou, 2010).

This network, as we shall see throughout the paper, has been enlarged as more Latinos, mainly Mexicans, begin working in programs and institutions related to the agricultural sector in Michigan and begin to support the transference of knowledge.

The network to which these producers belong began in Michoacán (México) where most of them come from, and where they made the decision to move to Chicago due to the support they could have in finding housing, searching for jobs and becoming part of a community as many others from their communities already lived there. Those factors as Carletto *et al.* (2006) suggest have a

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¹ In this respect the Latino producers fall into the two categories designed by the United States Department of Agriculture (USDA) to support farmers which are: Beginning Farmers and socially disadvantaged farmers.

significant role in the decision to migrate and influence the type of migration and destination.

The move to southwestern Michigan has also taken place through the ties obtained within this network. It begins as an opportunity of a small group to diversify their investments and little by little filters down to relatives and later friends of this primary group. The guiding light within the network is made up of a group of fellow countrymen who work in the field of real estate and let their relatives in Chicago know about the opportunities of investing in land which Americans are selling. The problem, which the network cannot solve, begins when the newcomers believe that besides being a good investment, obtaining the land may also be a new way in which to earn a living, through the local commercial production of berries, which implies obtaining a technological package and new forms of organization.

Becoming farmers means adopting a production system governed by business. Growing blueberries was not an ethnic enterprise (Menzies, 2007) so the community does not have the knowledge necessary for running farms. Thus, the Mexican migrants need the knowhow and tools in order to take up the American system of agriculture and compete successfully in the American agricultural market.

A group of scientists, extension and government agents of Latino origin, mainly Mexicans, have tried to help the producers by transmitting to them the knowledge they need in such a way that they can incorporate it into their work on the farms. This group, which we will refer to as "the extension agents" has become important actors within the producers network, to the extent that they adjust their frames of reference, which can be observed reflected in training and seminars adapted to the language and the knowledge of the Mexican producers and careful counseling, on the practices of cultivation.

The purpose of this paper is to document how an extension program can help them to adopt new practices and knowledge for improving their crops and selling blueberries and introduce those producers into the practices assumed by the American agricultural system. To illustrate this we describe a training project headed by Michigan State University (MSU) with the participation of federal and state agents and the National Autonomous University of Mexico (UNAM) as the evaluating entity. This project taught them through formal actions of training, production of materials, *in situ* counseling and the hiring of a specialist to advise the

producers, the contacts, links and intermediaries.

The paper is divided into four parts following this brief introduction. In the first, we present the research design. In the second, a brief summary of the categories and concepts used to analyze the material is presented. In the third part we will present some of the early results of the project in terms of changes in practices. And lastly, we will show the final thoughts on the way this project has helped the farmers adapt to the American system.

MATERIALS AND METHODS

A combination of qualitative and quantitative methods was used to show the way in which Mexican farmers are becoming a part of the American agricultural system. To this end we made a follow-up of the training sessions given previous to the initiation of this project and we carried out 2 surveys at different moments (2010, 2012) in order to follow the progress of the farmers who participated in the Project.² Open interviews were also made with 15 of the producers as well as with the agents, who were in charge of the training, employees of the government agencies which supported the sessions. Finally, we made on-site follow-ups of the classroom and field training.

Study site: The region analyzed is southwestern Michigan, specifically Allegan County with 22 Latino farms, Berrien County with 21, Van Buren County with 92 (USDA-NASS census of 2012). These counties are where the present training projects and those previous to this project were carried out which consisted of sessions in one of the classrooms of the Trevor Nichols Research Complex (TNRC) and on the farms of the producers located in Van Buren County.

Sample: In order to measure the progress of the project, a face to face questionnaire filled out by the evaluation team made up of mostly closed questions was applied to 24 farmers at the beginning of the project, and 17 farmers at the end of the project.

The farmers who were interviewed were 23 men and only one woman. Most of the producers are between 50 and 60 years old, showing that they are first generation Mexican immigrants who have had to wait for a while until they accumulated enough money to buy land. The level of schooling of the producers is low. Only 18% have studied beyond middle school, while the majority has at

2 The author was in charge of the evaluations of the Project and some of the results of the paper come from these evaluations.

best finished elementary school. Moreover, 9% of the producers have never studied. Also 18 out of the 24 said they spoke no English.

Networks to assimilate new practices: Curran *et al.* (1993) believe that networks are a cultural phenomenon, and therefore their analysis should take into account the relationships in terms of motivations, expectations, norms and values.

The perspective of networks has also contributed to explaining the patterns of entrepreneurship, to the extent that they analyze the social role of the entrepreneur, his roots, his social context and how these facilitate or inhibit business activities (Huggins, 2000).

The majority of those who have worked from the perspective of inter-firm networks (Hansen, 1995, Granovetter, 1985, Currant, 1993 and Huggins, 2000) acknowledge that these networks are connected to one another through some kind of sustained interaction, within which there may be a certain measure of homogeneity derived from the creation of common references. Thus inter-firm networks are formed between two or more businesses with common labor objectives or in order to solve common problems over a sustained period of interaction (Huggins, 2000). While social relationships are recognized to be important at start up, social, industry, professional and institutional links appear to become more important over time (Macpherson and Holt, 2007).

Returning to the case at hand, the strongest links that these farmers establish are: first with family and kin; second customers and markets, third with co-nationals. In the second and third groups they started with weak links and little by little the links became stronger. The Mexican farmers described in this paper, found themselves in a double dynamic, characterized by autonomy on the one hand and on the other hand very dependent on the bonds of trust and cooperation. A potential entrepreneur has a small group of friends and relatives who he trusts. Even American farmers cited as a classical example of how decision makers behave in a truly competitive market that they made decisions because the relations with others who were important to them influenced them. Farmers borrow money to expand when they were advised to do so by people whom they trust (Aldrich and Zimmer, 1986).

The kind of networks which we are interested in documenting here are knowledge networks which, according to Saexenian (1990) are made up of a set of

actors such as: academic, industrial and political institutions and liaisons who make for the free flow of information and drive the local conditions for innovation and whose objective is the construction and diffusion of knowledge. In sum, knowledge networks consist of supportive actors whose goal is to solve problems through the exchange of information and knowledge and technology transfer. The need for putting those who offer and those who require knowledge in touch becomes more apparent if we analyze the cultivation of blueberries from the point of view of the literature on innovation known as technological packages. In order for these packages to be adopted by the Mexican producers there are various prerequisites: a collection of knowledge (scientific, technical, empirical, economic and social); tools (tractors, machinery, manuals, courses, pesticides, fertilizers, etc.) and the organization for their use (administration, training, accounting, registration, techniques of cultivation, etc). According to Lundvall and Johnson (1994) and Medellin (2004), the technological package predisposes the following knowledge:

- Know what: knowledge on the facts; knowledge close to what is commonly called "information."
- Know why: the knowledge of the principles and laws of movement, of nature and society.
- Know how: the ability or capacity to do something.
- Know who: the information on who knows something, who knows how to do it, to whom one should turn when there is a problem.
- Know when: the ability to act opportunely in making decisions and attaining results. This implies the knowledge of the life cycle of the products and services as well as the cultural conditions of the business and environment.
- Know where: the ability to determine the most appropriate place and space for doing something.

This knowledge can be found in those who make up the package, but in order for the transfer to be successful, it is important to make sure that those who receive it "know" it well. For this reason, the tools that contribute to the process of the assimilation of the technology are one of the most important components of the package. These may be obtained through courses and consulting *in situ*, and through the formation of engineers and technicians in the place where the technology will be applied.

The Process of Building Trust: The knowledge

network built by Mexican farmers started with the information on buying the farms. Unfortunately this information is not sufficient to be able to operate a farm. Blueberry farms are not ethnic businesses as Menzies *et al.* (2007) suggests since while having Mexican workers and a number of Hispanics involved in the business, the market, the suppliers and above all the provision of knowledge and financing are originally designed by and for American producers and agents.

Besides, the knowledge was provided by American Institutions such as universities or agencies, and for these illegal immigrants who due to their migratory status have no contact with the American government, approaching these agricultural institutions is not an easy matter. To this must be added the language barrier, while although some speak English, they do have experience in documentation: they cannot fill out application or GAPs forms or draft business plans.

Realizing that, a group of scientists and extension agents from Michigan State University and employees, both American and Mexican, of the federal and state departments of agriculture, in 2008 started to transmit all the knowledge necessary for cultivating and commercializing blueberries to the Mexican producers. The promoters and participants from the agencies and the university became a kind of *technical and social translator*, trying to transmit to the producers what is going on in the agricultural system, as well as to the agricultural agencies the specifics and needs of this group of producers. Thus, the extension agents try to adjust the rules of the community of producers, urging them to utilize the technical infrastructure available to them (analysis of the soil, foliage, weather channels, manuals, etc.), and the rules of the agencies, proposing support programs, facilitating and adapting the necessary prerequisites. The work of the extension agents led to their "pulling in" the Mexican producers, little by little.

Three different aspects were emphasized in these courses. The first was the importance of keeping records on; dates, amounts and conditions of pesticide applications. These records are the only prerequisite which the packers ask the producers for in order to buy their fruit, so it was very easy to convince them of their importance. The second was to show them and institute the use of all of the new techniques, which were available for them to apply to growing their plants, specifically two: foliar analysis and soil analysis. Finally

was the work carried out by the agencies, which made up the agricultural system, especially the work related to conserving the environment.

In synthesis, the challenge of the training was to turn the information into knowledge, which could be assimilated by the producers in the areas of:

- Basic principles of the integral management of pests with emphasis on the cultivation of blueberries.
- Keeping records on the application of pesticides.
- Basic concepts of conservation planning.
- Programs and subsidies promoted by the various agencies.
- Practices of conservation of soil, water, forests, wetlands, etc.

The experiences the promoters acquired in these training sessions along with the concerns of the extension agents from MSU and the employees of local agencies who were interested in attracting an ever growing number of Mexican producers in the counties which they covered, was the breeding ground which allowed the project, which is the subject of this paper, to come into being. The project was the formalization of the activities carried out by the actors who had participated in the previous training sessions.

The "Project for Engaging Socially Disadvantaged Latino Farmers in the U.S. Agricultural System as related to Pest, Nutrient, and Conservation Management," presented and approved for 2009 to 2012, is an instrument, which aims at matching the opportunities that are offered in the American agricultural sector with the needs of the Latino producers. Two important goals were set:

- Involve the Latino producers in the support programs, as a means of introducing them to the American agricultural system.
- Advise these producers in the implementation of practices of conservation of resources, adoption of integral management of pests and nutrients in order to obtain abundant and healthy productions.

The starting point of this project is that these producers fall into the category introduced by the Department of Agriculture: *Socially disadvantaged farmers*. It also takes advantage of the technical abilities and knowledge of the various programs by the actors who make up the network of the people, who had worked with the agricultural producers, (Mexicans as well as Americans). Actors from various institutions and sectors participated in this

network (the government agencies who supervise, the businessmen who sell the pesticides, the area of the university extension offices, NGOs) who protect the producers and promote the knowledge flows, with different frameworks and who thus as actors in this network were more lenient with it in order to help the Latino farmers.

In order to comply with the objectives, a series of actions that supported the socialization of the knowledge of the actors from the institutions was integrated, along with the producers themselves who participated in the project, opening up spaces for telling their own experiences. At first the project was designed to organize between three and five workshops yearly in the classrooms, or in the warehouses of the producers. Training sessions were also took place on farms where the producers were advised on various techniques, which would be useful for the specific problems of that farm. Finally, a technician was hired on a part time basis to help the producers with pest control on their farms, with soil analysis, and with the appointments and explanations they needed in order to approach a given agency and ask for loans or subsidies. This person was a technician in agriculture who was fluent in Spanish and whose goal was to gain the trust of the producers and involve them in the program. The technician visited them on their farms, attended to their needs for knowledge, and had them carry out soil and foliar analysis, which he interpreted for them.

The workshops, training sessions and actions of the technician himself were aimed at increasing the knowledge of the producers, this understood in terms of Nonaka and Takeuchi (1995), as the result of the combination of experiences, values, information and knowhow, which constituted the framework for the inclusion of new experiences and information which could be put into action.

The specific knowledge dealt with in the project covers the following fields:

- Integral pest control.
- Conservation of natural resources, wetlands and roads, etc.
- Knowledge of insects.
- Management of water and soil.
- Foliar analysis.
- Knowledge of the government agencies.
- Direct relationships between nutrition and an increase in the yield of production of the fruit.

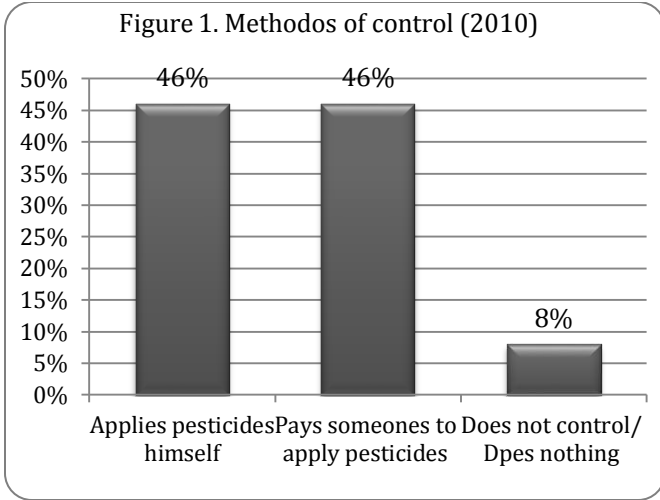
The sum of all this knowledge and knowhow becomes an important tool for working within the American agricultural system, for learning the American way of doing things.

Some of the earliest results of the project are presented in the following section, showing the way in which the knowledge acquired by the Mexican producers, enabled them to begin to modify their work practices and habits and therefore draw nearer to the American society in which they are living.

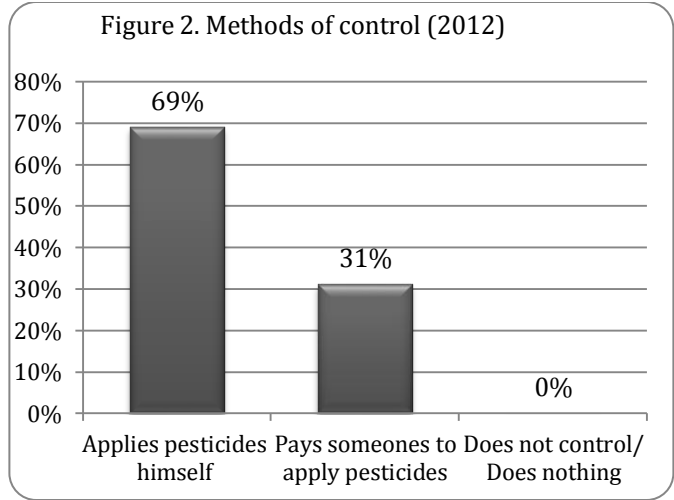
The first results of inclusion: For the construction of this section we will present the results of the evaluation. The objective of the evaluation was to measure the extent to which the knowledge received in the training sessions enables the immersion of the producers in the American agricultural system. It is interesting to point out that, most of the people who attend the training sessions have been carrying out agricultural activity for a time and see this as an investment strategy, second only to the investment in land. 26% of those who attended the course have been working at least 10 years in the field.

In addition 65% of those interviewed had taken some other courses. Of these 50% report that it was in these courses that they learned how to apply pesticides in order to control pests. The application of chemicals and recording the application is the first giant step towards complete management of a berry farm. This implies knowledge which ranges from how to apply the pesticide to what amounts to mix, when to apply it, where and how to protect the person who is applying it and working on the farm. In some cases, it also means knowing whom to turn to when there is no precise information on a pest and most important of all, it means how to keep minimum records, so that the packers will buy the fruit and the inspectors from the MDARD will not fine them. Keeping records is of vital importance, since it is the first step in documenting the operation of the farms, which in turn is the key to applying for subsidies and loans and going on to more complex certification such as GAP (Good Agricultural Practices) which will soon become a prerequisite for selling the berries.

In Figures 1 and 2 we can see how the participation in training sessions, and also considering the cultivation of blueberries as an economic alternative, have increased the number of producers who apply pesticides on their farms themselves.

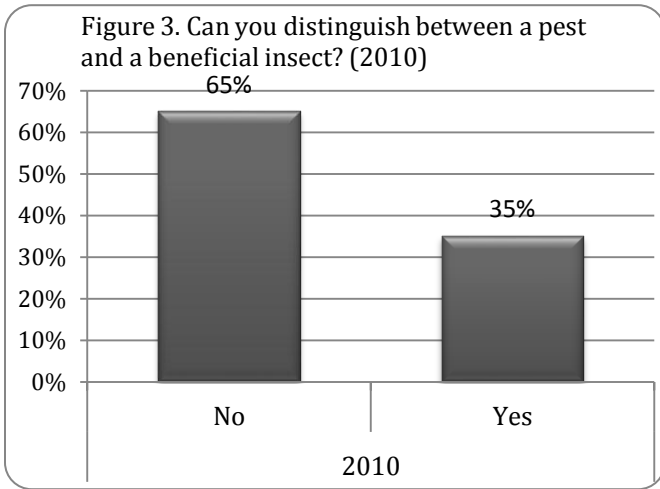


It is interesting to point out that four years after the training sessions, all of the producers answered that they take some kind of action to control pests, either applying the pesticides themselves or hiring someone else to do it. This means that those who were interviewed in the last survey continued growing blueberries and that the income from their sale is important for the family economy, since without applying pesticides they simply could not sell the fruit.



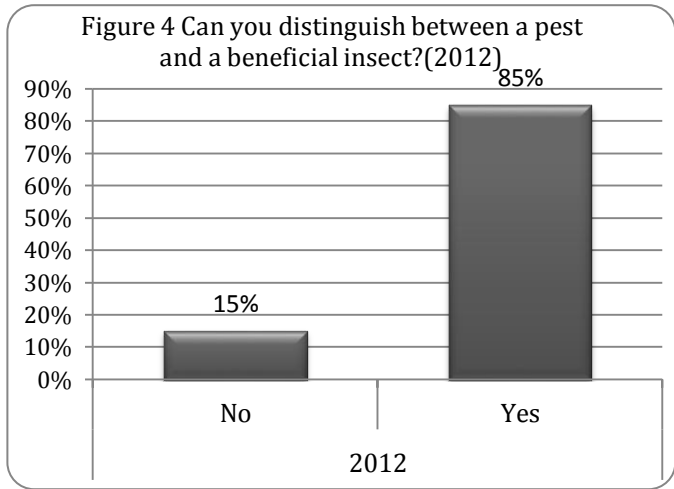
However the most relevant change is the increase of more than 20% in those producers who apply the chemicals themselves.

Three other factors are taken into consideration within the integral handling of pests. The first is to learn to distinguish between a beneficial insect and a pest. In the first survey it was found that very few producers could tell the difference, while in the last the percentage almost doubled (Figure 3 and 4).



The ability to distinguish between different types of insects was also cross checked with the data on those who applied the pesticides themselves. This information is relevant because these producers can, upon seeing an insect on their farms, apply the pesticides and thus the importance of knowing which insects are beneficial to controlling plagues on the crops, which pollinate the blueberry flowers and which are pests and what type of pests they are (Figure 5 and 6).

The second aspect refers to the place where the



producers store the chemicals which they apply themselves. The results of the two surveys are shown below in figures 7 and 8.

Having a special warehouse away from where other agricultural products are stored is related to the safe handling of toxic pesticides since it avoids contamination of the soil, of other agricultural implements and accidents caused by unintentional exposure to or consumption of the chemicals. The government programs consider this aspect so important that there are special subsidies for

chemical buildings whose specifications are highly regulated. In addition, inspections made by MDARD check to see that the pesticides are mixed and stored in special

spaces. The third aspect is related to the matter of who keeps the records on the application of pesticides (Figure 9 and 10).

Figure 5. Farmers who learn to distinguish pests from beneficial insects in the course (2010)

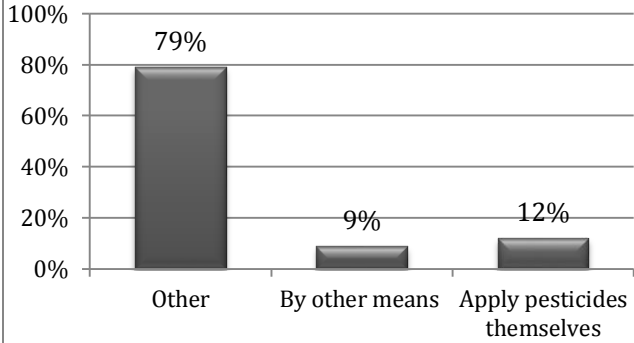


Figure 6. Farmers who learn to distinguish pests from beneficial insects in the course (2012)

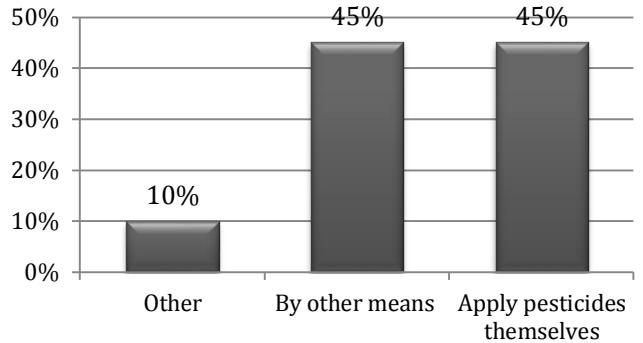


Figure 7. Where do you store the pesticide that you apply? (2010)

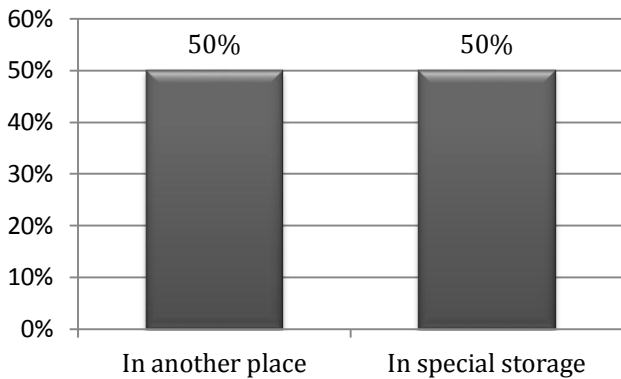


Figure 8. Where do you store the pesticide that you apply? (2012)

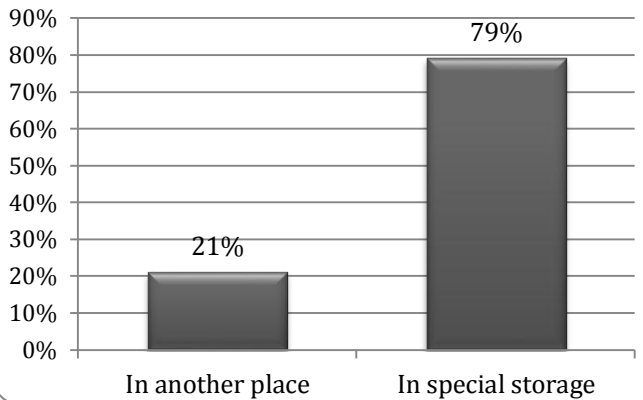


Figure 9. Do you keep records of the activities and practices you use to control pests and chemicals used? (2010)

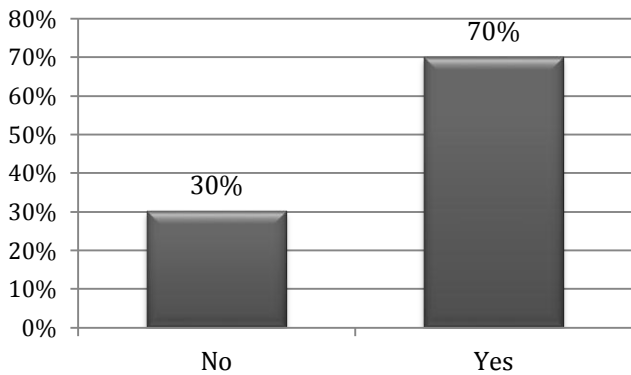
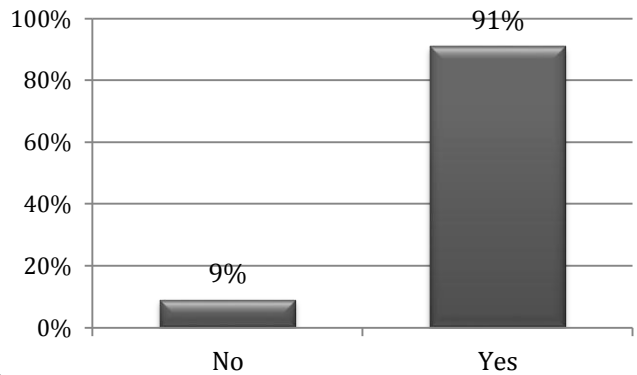


Figure 10. Do you keep records of the activities and practices you use to control pests and chemicals used? (2012)



The increase in the number of those who following training sessions recorded the products that they applied is noteworthy. Keeping records is relevant

because in these they begin to document part of the operation of their businesses. These records, which are required by the packing companies, the inspectors and

agricultural agencies in order to authorize subsidies and loans, are the first codified form of knowledge. This also constitutes a first link with the way things are done within the American agricultural system. In order to register the application of pesticides, it is necessary to be able to read the application instructions on the label. In order to carry out an efficient application it is also necessary to use the available meteorological information and be familiar with the location of the farm, and be able to document all of the previous information in a log where several items must be written down: the product which was applied, where it was applied, the precautions taken when applying it (for example placing warning signs so people would not enter that part of the farm, or using certain kinds of clothing), when it was applied and what amount was used.

While documentation of the operation is the entryway into the American agricultural system, in order to become 100% involved, it is necessary to work with the state and federal agencies which provide knowledge and financial resources for operating the farms. The first step in this process is getting to know the programs and understanding how they work and the final step is when the subsidy or loan which was applied for is authorized or when the producers understand why their application has been rejected. In the training sessions, conferences such as the following have been organized: Michigan Agriculture Environmental Assurance Program (MAEAP) by the MDARD whose objective is to warn of the risks of contamination on the farms; Pesticide and Plant Pest Management Division (PPPMD) also dependent on the MDARD and whose objective is to lay down the laws related to the use of the agricultural products ranging from exportation to pest control; Natural Resources Conservation Service (NRSC) of the United States Department of Agriculture (USDA), whose purpose is the preservation of natural resources; Food Standard Agency (FSA) whose objective is to regulate and propose changes in policies related to food, and this is the agency which gives credit for agricultural operation (purchasing tractors, land, etc.); and of course the various areas of MSU such as university extension, entomology and the Integral Pest Management Program (IPM). The conferences and presentations included topics such as:

- Introduction to training services in integral management of pests and what this means for the regulatory conservation agencies.
- Definition of a conservation plan and introduction

to the agricultural law, programs for working the land and education on the handling of pesticides.

- Keeping records, first for the application of pesticides and secondly for accessing the programs of the agencies.
- Tools for planning and developing specific plans for a given space (taught in the producer's orchard).
- Concept of a plan for conservation.
- Introduction to the support programs, characteristics, scope and prerequisites for application.

All of these conferences and training programs, some of them *in situ*, placed the actors of the various local agencies (many of them even spoke Spanish) in contact with the producers. This first contact allowed the producers to ask questions in order to clear up any doubts, but also at times to feel disappointed about their chance of "applying" for the programs. In order to strengthen the relationship with agencies the part time technician mentioned earlier was hired. He visited the producers, coaxed them to make appointments with the offices of the agencies (at times making the appointments himself) and he took them in order to clear up any problems, at times even helping them gather the necessary "papers". The initial result of these actions is that after the training the producers at least had an idea of the existence of agencies and programs. Before the training session only 29% of the producers knew of the programs and agencies and following the training sessions the percentage rose to 53% (10 out of 19 who were interviewed). The most well-known program was the Integrated Pest Management.

Also some producers have asked for support from the programs although when asked they cannot name the specific program. Some of them have been granted subsidies, which means that they have been able to comply with the prerequisites established for the programs. This means they are able to map their own farms; they know their conservation needs, production characteristics and have the detailed control of the expenses for the operation of the orchard and also for their family income. In order to know the strategies followed in the process of applying for subsidies and/or credit, in-depth interviews were made with those producers who had drawn on the programs, in which the following was found:

- Those who turned to the agencies called for more clarity in the evaluation systems and the kind of

prerequisites needed for applying for financing: “you keep me running back and forth and I use a lot of gas. I wish you would tell me what papers I need from the start.”

- Those farmers with children or young nieces and nephews who help them make the maps or gather and organize the information they are asked for, are more apt to obtain credit. More than one farmer proudly showed off the folder put together by his children, which had helped him obtain financing.
- The producers become involved in the programs little by little. They begin by asking for a small subsidy and /or loan which lets them see how the system works and then sometimes they bring themselves to ask for a larger amount, once they manage to understand the dynamics of keeping records of their operations and family expenses which the applications call for.
- More and more the producers who apply for these subsidies and /or loans are aware of the fact that the process is long, but results may be obtained; they can even point out where they are on the waiting lists.
- The producers are learning the importance of keeping records on all aspects of agricultural activity, from the Integral Pest Management (IPM) to how to apply for money from the various programs. They have also figured out how to collect the information, which they had not registered. For example one of them tells how he was able to find out the amount he spent on agricultural supplies by going to the store where he bought these supplies and having them give him the information.
- The producers seek support through the programs when they are “pushed” to do so by other producers or by the technician who helps them by setting up the appointment.

Last but not least, an important result of the inclusion is that the Latino producers are part of a knowledge network, which includes actors like the extension agents and the employees of the local agencies. They started to have stronger ties with some of the producers and the ties among themselves have also been fortified.

CONCLUSION AND RECOMMENDATION

The project strengthens the network between producers and extension agents who help the farmers to assimilate the technological package they need in order to

successfully produce blueberries, by passing on to the producers a series of abilities and knowledge which smoothes the way for changing their agricultural practices. We take up the elements pointed out by Lundvall and Johnson (1994) and Medellin (2004), to show how they are affecting the farmers’ actions:

- Know what: After the training the farmers have the information of the basics about IPM. They also have information about the subsidies and loans from the agencies. They know for example what nutrients are lacking in the soil; what information must be included on the labels so the packing companies will buy the fruit; what causes certain blights.
- Know why: This is the component with the least progress since although they follow certain practices, they do not understand yet why they have to follow them.
- Know how: Latino farmers started to keep records, deal with pests, storage, mixing and applying pesticides safely. They also know what the minimum requirements to apply for a loan or a subsidy are.
- Know who: Farmers know who the main actors related to the agriculture system in their counties are. They know for example who to contact when they need their pesticide certification.
- Know when: Farmers started to learn the pest cycle and when they have to spray for certain pest. This is a very important issue for preserving the blueberries until they are ready for the market.
- Know where: They know at least where they have to go if they have a problem or need a loan. They know where the offices of the agents are located in their counties.

While this knowledge is drawing the producers into the system, there are many other things which are still needed, above all because the system is becoming ever more complex. Within a year or two the packing companies are not only going to require the producers to record the use of pesticides, but they are going to begin to require other certifications such as GAP which calls for designing a working plan, the certification of the plan by the MDARD and subsequent compliance with the plan. Up to now none of the producers has managed to be certified although some have tried. The hope is that the tacit knowledge, codification and later knowledge flows help the Mexican producers confront the new

challenges that the productive activity, which they have become involved in, requires.

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