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Importance and Update of Direct Seed Certification Programs in North America

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Abstract

Conservation Agriculture and agricultural carbon (C) sequestration may be one of the most cost-effective ways to slow processes of global warming. As part of no-regret strategies, practices that sequester soil C help reduce soil erosion and improve water quality and are consistent with more sustainable and less chemically dependent agriculture. A clear understanding social, economic and environmental benefit's of direct seeding (DS) in Conservation Agriculture (CA) requires some form of standards for agricultural production. It is no longer enough for meat and vegetables to look and taste fresh, but it is more and more important to know where the food comes from, how it was produced, and who are involved in the various phases of the production chain. Certification of the standards will be expected and required by the consumer. There is a need to develop an international "certification program" for crops produced under CA with specific emphasis on direct seeding or no till production methods. The success of the implementation and certification process requires commitment from all levels and functions of the farm production system, especially from the farmer to the consumer. The sum of each individual benefit from certification adds to a total package with major significance on a global scale. Incorporating a DS certification system and C storage in CA planning demonstrates concern for our global resources and presents a positive role for CA that will have a major impact on our future quality of life.

Key Words: soil organic matter, soil quality, water quality, environmental quality, no-till, zero tillage, direct seeding, carbon sequestration

Introduction

Major social issues related to global food security revolve around the climate change and energy conservation. Climate change and an environmental degradation are a threat to production sustainability. As greenhouse gas mitigation strategies mature the important role of increasing carbon sequestration capacity of agricultural soils continues to gain prominence there are many positive attributes that accrue directly and indirectly to growers as they adopt and continue to use direct seeding practices and retain more carbon in the soil. Direct seeding systems for crops and pastures sequester carbon from the atmosphere into long-lived soil organic pools; they maintain and increase productivity, promote a healthy environment and strengthen rural communities. The ecosystem services provided by these production systems are critical to sustainable production systems as previously discussed by Reicosky, (2005). Thus, there is a need for updating verification and quantification of the ecosystem services through a direct seeding certification program in North America.

What is the certification process?

The development of an environmentally productive, profitable, and sustainable agriculture is one of the main challenges for mankind in the 21st Century. A clear understanding economic and environmental benefit's of direct seeding (DS) in conservation agriculture requires some form of standards for agricultural production. Certification of the standards will be expected and required by the consumer. For consumers, conformity of products and services to International Standards provides assurance about their quality, safety and reliability. The concept of a certification process was prompted by a special session at the II World Congress for Conservation Agriculture held at Iguassu Falls, Parana, Brazil on 11-15 August, 2003 (Trucco and Lorenzatti. 2003).

The dictionary defines certification as the act of certifying, or state of being certified or attested to. A certified statement or a certificate is the written testimony to the truth of any fact; the certification may a written declaration legally authenticated. Another example in education is a diploma or a document certifying that one has met the requirements of a course or school. Thus, the assessment of a quality production system against the requirements of standards and the subsequent issuing of a certificate to confirm that a product is in conformance with the standard's requirements is variously referred to in different countries as certification or registration. There is a need to develop an international "certification program" for crops produced under Conservation Agriculture (CA) with specific emphasis on direct seeding or no till. Concepts of "certification", "ecosystem services", "green labeling", "eco labeling" that involve "environmentally and socially acceptable" production practices are part of the effort to produce and market food and fiber using environmentally friendly techniques. Certification establishes agricultural producer's credibility and commitment to quality from day one. Because the task of explaining the specifics and demonstrating the effectiveness of your quality management system (QMS) is more straightforward, it takes less time to earn your prospective customers' trust and confidence. The above remarks also apply to the certification of direct seeding within conservation agriculture for environmental management systems required for the customers' trust and confidence.

The success of the implementation and certification process requires commitment from all levels and functions of the farm production system, especially from the farmer to the consumer. The system should embrace a wide range of management activities and include an environmental policy that embraces all environmental aspects and related legal requirements. Integrated management activities for the control of environmental aspects must include measurement and monitoring of environmental and system performance with periodic review, evaluation and improvement of the system. Agriculture must not only be economically profitable for it to be viable, but also morally and socially accepted and environmentally friendly, which means that it should not have a negative effect on the quality of the resources involved.

For CA farmers using direct seeding, it will be relatively simple to identify the environmental requirements to their existing management system. The certification process should be carried out in defined stages, which is cost effective and allows maximum opportunity for feedback and discussion, ensuring that there are no surprises during the final stages of the audit. A report is issued at each stage of development giving the findings in clear, concise and jargon free language. This allows problem areas to be identified and corrective action to be taken at the earliest opportunity, with minimum cost and disruption to production and certification.

Why Direct Seed certification?

Today's consumers want to eat fresh, tasty, healthy and safe food. They are also concerned about impacts on health, the ethical principles of food production, the composition of foodstuffs in the effect

of nutrients. Food is expected to be of high-and verifiable-quality and produced in an environmentally friendly manner. The quality strategy is based on values common to the whole sector: meeting the customer's needs, economic efficiency, sustainable development, and ethical standards. The demands of consumers relating to food quality have increased in a number of ways. It is no longer enough for meat and vegetables to look and taste fresh, but it is more and more important to know where the food comes from, how it was produced, and who are involved in the various phases of the production chain. Our real charge is to educate customers in the truth that conservation agriculture is absolutely safe and offers the best opportunity for sustainable production to increase the health and food supply for a global population destined to grow nearly 50% by 2050 while reducing the cost to produce this food and enhancing the environment. Certification specifies the most important requirements to identify, control and monitor the environmental aspects of CA, and also how to manage and improve the whole system to the final consumer.

Direct seeding (DS) as a form of conservation agriculture aims to conserve, improve and make more efficient use of natural resources through integrated management of available soil, water and biological resources combined with external inputs. Conservation agriculture contributes to global environmental conservation as well as to enhanced and sustained agricultural production and can play a central role in global agricultural policy. Food security and sustainability of soybean production are important for all citizens. Agriculture, the major industry for food and fiber production, is known to cause emission and storage of greenhouse gases. Intensification of agricultural production, primarily tillage, has been an important factor influencing greenhouse gas emission. Agricultural activities contribute to carbon dioxide (CO_2) emissions to the atmosphere through the combustion of fossil fuel, soil organic matter (SOM) decomposition and biomass burning. Improved conservation agricultural practices have great potential to increase soil carbon (C) sequestration and decrease net emissions of CO_2 and other greenhouse gases that contribute to global environmental security (Lal et al., 1998).

The principle of sustainable development and production ethics must be paramount in any certification system. New, environmentally-friendly and cost-reducing production methods and technologies are used. Direct seeding techniques are already being used around the world. The limitations and requirements set by the environment are taken into account so that we can work in harmony with nature. Nature is respected and the typical natural landscape is appropriately managed and preserved. Operations are open, responsible, just and reliable. Both the producer's promise and consumer's convictions are honoured meeting the physiological needs of animals and requirements of different species are taken into account.

Certification strategies to achieve this vision in agricultural production systems must include control and minimize soil erosion by employing practices designed to prevent wind and water from transporting soils away, and/or reduce physical and chemical degradation of soil and help farmers and ranchers identify soil quality indicators they can use to monitor their success in building soil health and productivity. Healthy and productive soils help increase rainfall infiltration and storage in the soil and are believed to require fewer imported nutrients. The strategies must include reduce tillage where possible, rotate crops and recycle organic residues back to the soil. This will enhance soil organic matter levels, the "engine" of soil quality, and lead to tie-up of carbon (carbon sequestration) in soil to help counteract atmospheric change due to greenhouse gas emissions resulting from human activity. Reduced tillage (in some cases) will also reduce soil compaction, alleviating runoff and infiltration problems. Reduced tillage aids in the adoption of water-conserving strategies as appropriate to the farm. These include new irrigation techniques, mulching, soil moisture monitoring and irrigation scheduling. Further extension of these strategies protects water quality by soil erosion control; careful management of nutrients, agrochemicals and manures; the use of landscape features such as buffer

strips and riparian habitat; and careful land application of wastewater from animal production operations. In animal production systems, livestock are raised with access to pasture/range when possible, and a system of management intensive grazing is employed to prevent overgrazing and erosion. Livestock and their manure waste do not adversely impact riparian habitat.

Any certification system must be simple and easy to use at the farm level or manager level. It must be able to be implemented by watershed committees, farmer cooperatives, and special consultants. The system must use relatively simple scientific models that have been validated by the research community. The certification system must be robust and have applicability over a wide range of geographic conditions. It must be decentralized and able handle site-specific situations. Most importantly it will require independent third-party verification based on industry standards previously established. The certification strategy work is comprehensive, it embraces the entire food sector: the producers, advisory organizations, production input industry, food industry, trade, research, education, management, and consumers. The aim is to build an unbroken quality chain from the field to the table. The certification strategy is transparent of the food production chain meaning that consumers must have access to information on the origin and the stages of production of the goods they buy.

Some social and cultural aspects need to be considered in the development of a DS certification system. Increasing consumer awareness and educating the consumer and the farmer about on-site and off-site benefits accrued with DS technology. Certification will give the consumer a choice of food produced using environmentally friendly techniques compared to other systems that may not be truly sustainable. The certification provides tangible evidence of an intangible benefit that protects environment quality. Certification can lead to financial incentives for conservation in the development of a market niche for food produced under environmentally friendly conditions. This is not only value-added service from the farmer, but also value added-service for society who will help pay for the social and environmental benefits of direct seeding technology. Last but not least is the sense of personal pride and satisfaction of the DS farmer for doing the "right thing" for the environment. The certification process can serve as a tangible document of the conservation applied to the land. In this way, the DS farmer can leave a legacy to following generations assuring them of a sustainable future in agricultural production.

What can we certify?

Soil and water are required resources for life on Earth. Most terrestrial life needs a continual source of water for sustenance and soil is an essential medium for plant growth in most terrestrial ecosystems, providing nutrients, water, physical support, and biological interactions with roots. Soil and water are closely linked in nature, impacting each other through the hydrologic, geo-chemical and energy cycles. In most cases, an impact on the soil system has a direct impact on water resources. Both soil and water are renewable resources in natural systems and when managed properly can be used in a sustainable manner. Soil formation is a natural and on-going process, but it generally takes 500-1,000 years to develop 2.5 cm (one inch) of topsoil. In contrast, many agricultural fields experience soil erosion rates 3-10 times higher than this, leading to an unsustainable situation. Similarly, water can be viewed as a renewable resource. It can be used over and over if its quality is not degraded. With the appropriate research information, we can certify practices and processes that maintain and protect these valuable resources.

Many agricultural operations are major users of water in certain parts of the country. Where farm/ranch use does not exceed typical replenishment rates, irrigation is a sustainable practice. However, with

urban growth, there is increasing competition for limited water resources and agriculture is under pressure to improve water management both in terms of quality and quantity. Additionally, agricultural operations impact water quality when fertilizers reach surface and groundwater, and when compacted and exposed soils cannot absorb rainfall; this leads to runoff that often contains soil particles and fertilizers that affects water quality of rivers and lakes.

A possible area of need is an assessment and verification system and professionals that involves certified assessors or verifier's who can truly evaluate agricultural lands for their greenhouse gas mitigation potential. Agricultural lands have been viewed as being part of the solution, but the debate continues as some groups do not support this view entry for non-terrestrial forms of carbon sequestration. A respected assessment followed by a verification process would help buyers and sellers of carbon credits have more faith in the system. Carbon and nitrogen are components of the greenhouse gases, but they're also nutrients essential to plant growth. Within the US, the American Society of Agronomy and the Soil Science Society of America represent professional scientific organizations that provide certified professional agronomists and certified professional soil scientist to address production related issues. These individuals would probably need some specialized training in greenhouse gas mitigation and in the role of direct seeding techniques that could be supplemented through a continuing education process to provide science based technical certification of the ecosystem services.

Development of a Direct Seed Certification System based on CA principles

Soil quality is the fundamental foundation of environmental quality. Soil quality is largely governed by soil organic matter (SOM) content, which is dynamic and responds effectively to changes in soil management, primarily tillage and C input. Maintaining soil quality can reduce problems of land degradation, decreasing soil fertility, and rapidly declining production levels that occur in large parts of the world needing the basic principles of good farming practice. Conservation agriculture implies conformity with all three of the principles or pillars. These three principles are 1) minimum soil tillage disturbance, 2) continuous plant residue cover, and 3) diverse crop rotations and/or cover crops. The foundation underlying the three principles is how these three principles interact with and contribute to soil C, the primary determinant of soil quality. Reduced tillage methods, sometimes referred to as conservation tillage, such as strip tillage, ridge tillage, and mulch tillage disturb a small volume of soil and partially mix the residue with the soil are intermediate on their soil quality effects. These terms require explicit definition of the tillage equipment and operation characteristics as they relate to soil volume disturbed and degree of soil-residue mixing. The extreme forms of intensive inversion tillage that include the moldboard plow, disk harrow and certain types of powered rotary tillage tools cannot be considered a form of conservation.

In concept, it is possible to develop indexes, loosely referred to as Conservation Agriculture Index (CAI), expressing the relative benefits for the practices boarding the three principles of conservation agriculture. It may be possible to develop a tillage index, for the minimum value representing minimum soil disturbance and low carbon loss according to the work of Reicosky and Lindstrom (1993 &1995). They found that tillage-induced carbon loss was directed proportional to the volume of soil disturbed in the tillage operation. This, combined with the extra fossil fuel used for deep tillage, could provide a basis for calculating a tillage index. In a similar manner, it may be possible to develop a soil cover index that reflects the amount and effectiveness of "dead" residue cover and protecting soil. This index would include such factors as the amount and type of residue in the duration of the protective beneficial effects throughout the year. A part of this index could be the crop canopy cover

for the living crop that also serves to protect the soil from raindrop impact while it is the primary source of carbon input. Some of these factors are already contained in the Revised Universal Soil Loss Equation (Renard et al., 1997). In a similar fashion, rotation intensity and biodiversity indexes for diverse crop rotations and cover crops developed by Beck, (1993 and personal communication) may be useful in establishing an index to reflect a "diversity index". The magnitude of the index would be higher with several different types of crops in the rotation or with cover crops in those climates were growing season length and water are not restrictive.

Examples of certification systems

ISO- "International Organization for Standardization"

http://www.iso.org/iso/en/aboutiso/introduction/index.html

The International Organization of Standardization, (ISO) is a worldwide organization that develops many different kinds of Standards. It was set up in 1947 and is located in Geneva, Switzerland. Its purpose is to facilitate and support international trade by developing standards that people everywhere would recognize and respect. ISO achieves this purpose through the participation and support of its member bodies. ISO is a network of the national standards institutes of 151 countries, on the basis of one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system. ISO is a non-governmental organization: its members are not, as is the case in the United Nations system, delegations of national governments. Nevertheless, ISO occupies a special position between the public and private sectors. This is because, on the one hand, many of its member institutes are part of the governmental structure of their countries, or are mandated by their government. On the other hand, other members have their roots uniquely in the private sector, having been set up by national partnerships of industry associations. ISO standards are developed by technical committees. The people who serve on these technical committees come from many national standards organizations. Therefore, ISO is able to act as a bridging organization in which a consensus can be reached on solutions that meet both the requirements of business and the broader needs of society, such as the needs of stakeholder groups like consumers and users.

Food Alliance rating system

http://www.foodalliance.org/

Food Alliance is a non-profit organization that promotes sustainable agriculture by recognizing and rewarding farmers who produce food in environmentally friendly and socially responsible ways, and educating consumers and others in the food system about the benefits of sustainable agriculture. Their vision for soil and water conservation is one where farmers and ranchers improve soil resources and productivity, protect or improve water quality, and efficiently use water at renewable levels. Management practices and tools are chosen that can achieve this vision while enhancing farm/ranch productive integrity and profitability. Such operations will deliver important ecological benefits to society, such as clean water and wildlife habitat. Where conservation activities cost more to adopt, various public programs can offset this added expense. Market-based approaches such as Food Alliance or organic certification are, in part, aimed at overcoming such economic disincentives for sustainable agriculture.

Food Alliance is widely recognized as one of the nation's leading certification organizations for environmentally friendly and socially responsible agriculture products. The Food Alliance Stewardship Council and Board of Directors use these guiding principles to inform and direct their governance. The guiding principles provide a detailed definition of how Food Alliance defines environmental and social responsibility in agricultural production. When considered altogether the guiding principles describe an ideal, comprehensive approach to agricultural production. In order to become Food Alliance certified, farmers and ranchers commit to improving their operations with respect to the guiding principles. Improvement efforts are evaluated over time by Food Alliance site inspectors. Each of the guiding principles has either a fixed standard or at minimum an individual evaluation item dedicated to it. Food Alliance certified farmers meet strict standards in the areas of pesticide reduction, soil and water conservation, wildlife habitat conservation and safe and fair working conditions.

Food Alliance certified producers protect water resources by using methods such as: creating buffer zones along waterways, reducing chemical and sediment runoff, managing animal wastes to prevent ground and/or surface water contamination, and using tillage practices that conserve organic matter and soil aggregation. Food Alliance producers conserve water by encouraging infiltration and storage of rainfall in the soil. Additionally, they increase irrigation water efficiency through soil moisture monitoring and the use of new irrigation technologies. Certified producers reduce erosion and protect soils by optimizing plant cover throughout the year, by establishing permanent vegetative cover in orchards and vineyards, and by using pastures and management intensive grazing. Food Alliance producers use crop rotations that include cover crops in order to build soil organic matter and productivity. Finally, they select tillage technologies that minimize degradation of soil quality. Certified producers conserve and recycle nutrients by converting organic wastes into productive uses and by seeking ways to generate nutrients on farm through such methods as cover cropping, on-farm composting, and integrating livestock into farm production. Food Alliance's certification uses a third-party evaluation process. Food Alliance engages private contractors to perform on-site evaluations of applicants to the certification program. Food Alliance has developed detailed evaluation tools for inspectors to use, designed to verify on-farm practices and make recommendations for certification.

Examples of successful direct seeding certification programs

Shepherds Grain

http://www.shepherdsgrain.com/

Karl Kupers and his partner Fred Fleming, farmers from the Pacific Northwest Directs Seed Association in northwest USA have started an organization called Shepherds Grain to market food grown using the eco friendly techniques such as direct seeding. Shepherd's Grain comes from an alliance of more than 30 progressive family farms dedicated to practicing sustainable agriculture. Their farming practices have been certified "environmentally and socially responsible" by Food Alliance, a nonprofit certifying organization described earlier. Food Alliance's certification uses a third-party evaluation process. The farmer’s dedication to service and quality produce high quality products from the crops raised. In this way, the consumer gets the best nature has to offer directly from their Pacific Northwest farms.

In a brief conversation with Karl Kupers, he made several points from his experiences that are critical to the acceptance of direct seed certification and the associated benefits in wheat production systems. The most important part of the certification story has been the forming of relationships. One point that he

made was that the social component was very critical to get the consumer to understand and pay for the environmental benefits. Is important to make the consumer aware of where their food comes from. It is critically important to communicate face-to-face with the consumer the benefits of the direct seeding systems. As a producer, he had become not only the first wheat producer certified by The Food Alliance but the first direct-seed producer so certified, which helped set the stage for his new marketing venture as did a survey of potential customers seeking to learn why they purchased what they did. He has gone so far as to invite them to his farm to observe his planting and harvesting operations to be sure the consumer understood how these benefits affect the sustainability of the production systems. Another point that he made was to be honest and be sure that the true cost of production was transparent to the consumer. He indicated the consumer is not afraid to pay a fair price as long as they know what they are paying for. This is where the certification process becomes critical and can result in a 10 to 12% increase in value added to his product. He believes that the additional costs associated with innovation are more than offset by the premiums received from direct marketing. He also believes that the greatest economic benefits will be in the future, when the improved fertility caused by his new production systems will improve productivity. Direct-seeding and crop rotations have already significantly increased the value of and created a demand for the land that he leases.

In order to capture value and market share through his commitment to sustainability, Karl became the first Food Alliance certified grain grower. Food Alliance certification and market development efforts facilitated his marketing of grain direct to food processors, such as artisan bakeries. Another way that Karl is marketing the sustainability of his farm is through the Pacific Northwest Direct Seed Association. PNDSA has entered a carbon credit lease agreement with Entergy (southern energy utility) for carbon sequestered through direct-seed cropping systems.

Direct seeding, carbon sequestration, crop rotations, land tenure, Food Alliance certification and relationship marketing are all pieces of the much larger picture of sustainability. None of them alone is "the answer" to challenges of farming. As enough of the pieces come together in a package, there is great potential for improving the sustainability of agriculture. Each of the pieces complements the others and learning how to see these complementarities is a key to success. As other units of the food system, such as dairy farms, food processors and retailers, begin to value sustainability, it makes sense to link them together to capture "life-cycle" sustainability of a product. With this in mind, Karl Kupers has encouraged other links in his value chain to become Food Alliance certified – so that there is third party verification of sustainability from seed to consumer.

Terre Vivante – "Living Earth"

http://terrevivante.ca/fichiers/cahierCharges_terreVivante_culturesEte_3aout08.pdf

The "Terra Vivante" certification scheme in Québec creates value added for wheat growers as members of the "Club Action Semis Direct", loosely translated as Direct Seeding Club, as a result of a collaboration of the Jocelyn Michon, president of the "Club Action Semis Direct" and Ms. Odette Ménard, conseillère of soil conservation and water for the Direction régionale de la Montérégie-Est Department of Agriculture, Fisheries and Food (MAPAQ). Their direct collaboration has launched the certification Earth Alive. While there are other types of certification available, this discussion will focus only on the certification process associated with direct seeding. The direct seeding certification process allows farmers to educate their peers, as well as consumers about the techniques of soil conservation. The Living Earth seeks certification as a first step the production of wheat. In the coming years, they believe that the popularity of direct seeding will expand certification to other productions, both in large crops and in animal production.

The “Terra Vivante” certification program started as a result of the efforts of Jocelyn Michon, one of the first growers in the province of Quebec to widely adopt direct seeding practices on his farm. His success with no-till farming inspired many other growers in his area and across the province to adopt direct seeding practices on their own farms and at the same time become better stewards of their soils. Jocelyn’s tireless efforts earned him a significant award from the Soil Conservation Council of Canada (SCCC). Jocelyn has participated in countless events and courses where he has given valuable information on how to make direct seeding work for each participant. He and his wife Nicole have also hosted numerous groups of visitors from various backgrounds to show soil conservation in action. This has taken courage, especially in the early years when direct seed farming was almost non-existent in the province and there was a high degree of skepticism among some growers and market influencers. In the last seven years, Jocelyn provided great leadership to the 'Club Action Semis Direct that led to a significant increase in club membership and also to the development of the 'Terre Vivante' certification, a unique initiative which creates value for wheat grown by members of the club. Jocelyn was inducted into the Quebec Soil Conservation Hall of Fame in the mid-1990s and in 2005 received the Agro-Environmental Award given by l'Ordre du mérite agricole du Quebec.

According to Ms. Odette Ménard, conseillère soil conservation and water MAPAQ, an estimated 5% in Quebec agricultural area cultivated using the technique of direct seeding. She notes that more and more farmers are interested however, these farmers must meet all the criteria for certification. The credibility challenge of any certification is the image given to the consumer which is critically important in the value added. Crop residue cover is its central point as it allows verification of the absence of soil disturbance. During the post-planting visit, the inspector shall ensure that 40% or more residue cover the field. The producer must have adopted direct seeding for at least three years and commit to continue this practice for the entire current year. It is possible to harvest the straw, use manure and work in a superficial way to incorporate the manure, but they must always remember to keep 40% of residues on the surface. This means that we can not undertake tillage or leveling operations or implement a green manure when the field is certified for direct seeding. The use of pesticides and fertilizers is allowed. According agronomist Odette Ménard, Regional Adviser in soil conservation and water MAPAQ, certification does not allow certain practices, even if they are agronomically correct.

Jocelyn Michon, president of the club till action, states that by creating certification Earth alive, we want to bring added value to the grain grown by direct seeding. Producers who are in their first and second year of direct seeding can receive a premium of $25 per tonne for wheat grown under Conservation Agriculture Practices (CAP). There is also a saving of organizational costs and analysis of the marketing department of the Federation of commercial producers. As for cost, those who want to produce wheat must pay membership fees to the direct seeding club of $75 annually, $5 per hectare fees for their land and the cost of inspection and the issuance of certificates for the harvest another $2 per tonne of wheat. Compared with wheat marketed through the usual marketing schemes, there would be an economic benefit of about $50 for each ton of wheat certified “Terra Vivante”.

There's no question that significant progress has been made in on the soil conservation front over the past several years, at the same time, there is still much room for improvement. That's why it's so important to celebrate 'soil champions' such as Jocelyn Michon and Odette Ménard who represent the goals and success of the soil conservation movement and the evolution of the certification process for enhanced environmental quality.

Summary

Numerous environmental benefits may result from agricultural activities that sequester soil C and contribute to environmental security using Conservation Agriculture. A clear understanding social, economic and environmental benefit's of direct seeding (DS) in Conservation Agriculture (CA) requires some form of certification or standards for agricultural production. It is no longer enough for meat and vegetables to look and taste fresh, but it is more and more important to know where the food comes from, how it was produced, and who are involved in the various phases of the production chain. Certification of the standards will be expected and required by the consumer. There is a need to develop an international "certification program" for crops produced under CA with specific emphasis on direct seeding or no till production methods. The success of the implementation and certification process requires commitment from all levels and functions of the farm production system, especially from the farmer to the consumer. The certification strategy in the examples is comprehensive, it embraces the entire food sector: the producers, advisory organizations, production input industry, food industry, trade, research, education, management, and consumers. The sum of each individual benefit from certification adds to a total package with major significance on a global scale with a major impact on our future quality of life.

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