ICROFS news

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Newsletter from the International Centre for Research in Organic Food Systems

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ICROFS joins Landscapes for People, Food and Nature Initiative

Your input to *ICROFS news*

We listen to our readers's response with pleasure, as we are here for you!
Therefore, any responses are more than welcome, be it about the new format, suggestions to improvements, changes, content or anything you can think of.

Contact us at: LindaS.Sorensen@icrofs.org

ICROFS joins Landscapes for People, Food and Nature Initiative

A consensus is emerging that many of our production systems for food, forest and wetland products are unsustainable for people, for long-term food and fiber supply and for nature.

However, farmers, policymakers, food companies, conservation agencies and grassroots organizations in all parts of the world are generating innovations to meet the challenge. Since, over two-thirds of the world's land area is shaped by cropland, planted pastures, or other agricultural practices, it is critical to scale up such integrated systems to combat both hunger and environmental degradation.

In an effort to strengthen such approaches, ICROFS is a proud partner of the international Landscapes for People, Food and Nature, an International Initiative for dialogue, learning and action.

New blog: Landscapes for People, Food and Nature

The Landscapes for People, Food and Nature initiative has launched a new blog on January 30th, 2012. The landscapes Blog will help increase awareness of integrated agricultural landscapes, foster a dynamic community of practice, and highlight the work of co-organizers and other practitioners on a landscape scale.

Read more at http://www.icrofs.org/pdf/2011

Organic Eprints is rising in the ranks

Every 6 months, the "Ranking Web of World Repositories" publishes a new ranking list. As last time, Organic Eprints was placed higher on the list than previously. On the list of more than 1200 institutional and subject repositories from the whole world, Organic Eprints made it as number 36. Furthermore, on the list of the top 100 repositories from Europe, Organic Eprints was number 14.

In addition, Organic Eprints has been featured as one of the success stories of Open Access – as one out of three repositories chosen from Denmark.

Read more at http://www.oastories.org/2011/09/denmark-repository-organic-eprints/ .

Try the VOA³R platform beta-version

The VOA³R platform is now available in beta version at http://voa3r.cc.uah.es.

VOA³R stands for the EU ICT PSP project "Virtual Open Access Agriculture & Aquacul¬ture Repository: Sharing Scientific and Scholarly Research related to Agricul¬ture, Food, and Environment."

Several archives with agricultural open access content have already been integrated in the portal, and more will continuously be integrated. Organic Eprints is one of the archives, one of the others is the institutional archive of SLU (Swedish University of Agricultural Sciences), which also contains literature relevant for organic agriculture.

In addition, a special agreement with the Food and Agriculture Organization (FAO) of the United Nations allows VOA3R to have access to their open access repository.

A social network has been built to enable researchers to connect to each other, participate in groups on specific areas of interest, enter information about their research and more. Innovative search and browse features such as tag based search and navigational search, timeline browse, map browse and browse by year are already available.

Give your opinion about the portal and its features by answering some questions to help improving the VOA3R portal: http://www.unipark.de/uc/VOA3R_Portal_Questionnaire.

CORE Organic II

The second call for pre-proposals of research projects is closed

Six pre-proposals were submitted for the thematic area "plant-breeding" and four for the area "organic market". The pre-proposals are being evaluated and the results will be communicated to the applicants by 9 March 2012.

An overview of the steps in the selection procedure can be found here: http://www.coreorganic2.org/Upload/CoreOrganic2/Document/Processes_information_for_applicants.pdf

Healthy herbs for healthy cows

Cows on grass prefer a diet that includes herbs rather than pure grass. Scientists from Aarhus University have studied a selection of herbs and their potentially beneficial effects. The work was part of the Darcof III project, ORMILKQUAL on the effect of pasture composition on milk production.

Read more at http://agrsci.au.dk/en/nyheder/artikel/koeernes-sunde-urtekoekken/

International organic research

ICROFS' second topic theme: Organic research in Brazil

ICROFS news presents two articles from Embrapa (research centers of Brazilian Enterprise of Agricultural Research) - one general article on research experiences on organic agriculture from Brazil - and one on organic milk production in Brazil.
Furthermore we are presenting two articles from the Mokichi Okada Research Center in Brazil, doing research on sustainable agriculture based on Nature Farming principles advocated by Mokichi Okada. The articles describe the history and research activities at the center and presents results from a project on alternative fertilization in degraded pasture.

Research activities on sustainable and organic agriculture in Brazil

Current organic research programmes and projects in different countries

In this issue - and in forthcoming issues - *ICROFS news* will bring a number of topic themes presenting current research programmes in different countries on the globe.

Research experiences on organic agriculture from Brazil

By José Antonio Azevedo Espindola[1], Dejair Lopes de Almeida[2], Raul de Lucena Duarte Ribeiro[3], José Guilherme Marinho Guerra[1], Ednaldo da Silva Araújo, Ricardo Trippia dos Guimarães Peixoto[4]

The number of organic agriculture systems has been increasing in Brazil. It is important to develop appropriate technologies to these agroecosystems.

This article describes two research experiences achieved by a network formed by research centers of Brazilian Enterprise of Agricultural Research (Embrapa) and several partner institutions.

About the authors

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The Integrated System of Agroecological Production (ISAP) was created in 1993. It is conducted by a partnership between four institutions: Embrapa Agrobiology, Embrapa Soils, Agricultural Research Enterprise of the State of Rio de Janeiro (PESAGRO-RIO) and Federal Rural University of the State of Rio de Janeiro (UFRRJ). ISAP represents a space for the development of agroecology, on a scientific basis. Their research activities are based on crop diversification, integration of animal and plant production, and utilization of biological nitrogen fixation.

Organic fertilization

Organic fertilization before planting of vegetables is done with cattle manure, obtained from ISAP bovines, while organic fertilization by side-dressing fertilization is done with castor oil cake. Compost and vermicompost are prepared with cattle manure and crop residues, being used to prepare substrates for the production of vegetable seedlings.

Green manures are employed in crop rotations or intercroppings. Tropical legumes such as pigeon pea (Cajanus cajan), sunn hemp (Crotalaria juncea) and velvet bean (Mucuna pruriens) may be grown during the period of spring-summer, followed by vegetables which are cultivated in the period of fall-winter. Tropical legumes may be mixed with grasses, aiming to increase the period of soil cover by the residues of green manures.

Intercropping between tropical legumes and vegetables is also evaluated. Examples of promising results were obtained for intercropping like broccoli-pigeon pea, eggplant-cowpea (Vigna unguiculata), and sweet pepper-sunn hemp.

Crop diversification contributes to a better use of natural resources (Photo 1), creating a possibility that pests remain at tolerable levels. Some intercrops were recommended by studies conducted at ISAP: cabbage-radish, carrot-radish, egg-plant-green bean, lettuce-onion, lettuce-carrot, and sweet pepper-green bean.

Evaluation of agroforestry systems

Agroforestry systems are evaluated in ISAP, varying in relation to the involved number of species. One of them is the alley cropping with the cultivation of vegetables or ornamental plants between lines of the leguminous tree gliricidia (Gliricidia sepium). Residues from the pruning of this tree may be used as green manure or as fodder for the

Area cultivated with various vegetables, at ISAP (Photo by Nátia Élen Auras)

Installation for hens (Photo by Nátia Élen Auras)

cattle. A second example of agroforestry system is the shaded coffee. The trees gliricidia or eritrina (Erythrina variegata) did not affect the yield of Conilon coffee (Coffea canephora) after four years of intercropping. Another example consists of an agroforestry corridor, formed by a high number of vegetable species. It connects two forestry fragments, allowing animal and seed flux in the area.

The described results, as well as the participation of researchers and technicians of the partner institutions, have made the success of ISAP possible. It is recognized as a reference of research on Brazilian organic agriculture.

Research network on organic agriculture

The accumulated experiences of ISAP furnished a model to the formation of a research network on organic agriculture at Embrapa, in 2002. Nowadays, this network is organized in the project "Scientific and Technological Basis for the Development of Organic Agriculture in Brazil". This project involves 28 research centers of Embrapa, with a team of 330 researchers and technicians, besides 25 partner institutions, such as NGOs, universities, and research and extension institutions.

The objective of this project is to contribute to the generation of knowledge and technologies for organic agriculture, offering information about animal and crop production, postharvest and socioeconomic aspects. Some of the obtained results, are described below:

a) Evaluation of cultivars:
Until now, 25 cultivars of vegetables, 19 cultivars of grains, and 10 cultivars of fruits and coffee for organic systems have been identified.

b) Plant health:
Insect pests, pathogens and their natural enemies have been monitored, aiming to understand the dynamics of their populations in organic systems. Alternative technologies of biological and cultural control of insect pests and pathogens have also been developed.

c) Management of natural resources:
The impact of agricultural practices, has been evaluated with the measurement of soil quality indicators. Another research aspect is the application of inputs for soil management, such as biofertilizers and composts.

d) Animal production:
Results were obtained about genotypes for meat and egg production, alternative methods for the control of animal diseases, and agricultural practices for the production of forage species. Recommendations for increasing animal welfare were also developed (Photo 2).

e) Crop production:
Soil cover crops were evaluated in relation to control of erosion and nutrient cycling, as well as to control weeds in vegetables production systems. Strategies of crop diversification were also evaluated in crop rotations, intercropping and agroforestry systems.

f) Food technology:
Technologies for processing and conservation of organic food were developed, especially for fruit and maize.

g) Socioeconomic aspects:
Socioeconomic and ambiental aspects of organic systems were evaluated, in different Brazilian regions. Agroecological experiences were systematized, involving organic farmers in a participatory approach.

Although recognizing, that these results represent an advance in the knowledge on organic agriculture, it is still necessary to carry out further research.

Future scientific contributions

Scientific contributions expected for the future, are listed below:
(i) evaluation of practices which combine management of cover crops and conservation tillage systems;

(ii) identification of new cultivars adapted to organic agriculture;

(iii) evaluation of new designs for organic production systems, which enhance the use of natural resources;

(iv) enlargement of the studies on conservation biological control, stimulating the increase of the populations of natural enemies of pests;

(v) studies about quality of organic food.

For this reason, the research network on organic agriculture will submit new proposals to continue its activities in the next years.

Organic milk production in Brazil: Technologies for sustainable production

By João Paulo Guimarães Soares - Embrapa Cerrados, Ana Karina Dias Salman - Embrapa Rondônia, Luiz Magalhaes Januario Aroeira - Embrapa Dairy Cattle / UFERSA, Adivaldo Henrique da Fonseca, Argemiro Sanavria, Jenevaldo Barbosa da Silva, Gisele Maria Fagundes - Federal Rural University of Rio de Janeiro (UFRRJ).

This article focuses on some technologies developed and adapted by Embrapa (the Brazilian Agricultural Research Corporation) and some institutional partners which aimed to provide results of research for solving bottlenecks identified for organic milk production in Brazil, such as legislation organization and technologies for nutrition and health of livestock in organic farming.

In the last years, a major effort has been done for adaptation and validation of the main results of research related to systems for dairy organic production.

In 2005 the organic milk production in Brazil was estimated to 0.01% (2.4 million liters) of the total milk production, but in 2010 this production had increased to 0.02% (6.8 million liters) of the national milk production (30 billion liters). This is according to preliminary data from surveys of the Project "Systems for Organic Farming" developed by researchers of the Brazilian Agricultural Research Corporation (Embrapa), which involves dairy producers and cooperatives of many States of Brazil.

Although this slight volume of production and the waiver of some dairy farmers from States of Rio de Janeiro and Minas Gerais, an increase of 187% in organic dairy production was observed for the period 2005 – 2010. This was due to the establishment of cooperative projects and some cooperative expansion in southern Brazil and in the region of Triângulo Mineiro (State of Minas Gerais), respectively, which involved many dairy producers in transition or who had received certification.

Organic milk production - economically viable

Another study indicated that production of organic milk in Brazil is economically viable, since the capital

Cow handling in Brzil

	Conventional	Organic
Number of lactating cows	100	52
Milk yield (litres/cow/day)	12	8,0
Calving interval (months)	13,8	14,3
Lactation period (days)	300	270
Lactating cows (%)	71	64
Use of area (AU/ha)	2,1	1,3
Total Operacional costs (R$/l)	0,37	0,5
Remuneration	2% per year	5% per year

*Table. Results from a study comparing two production systems (conventional and organic). * Different prices were used R$ 0,40/ Litre e R$ 0,68/Litre, for a convencional and organic systems respectively*

return is 5% per year, higher than that of 2% per year obtained by the conventional system. Even with a reduction of 33% in productivity per cow and with an increase in cost of land (63%) and hand labor (47%), which increased in 50% the total cost per liter of milk produced, the aggregate value of the product depending on the region ranges from 50 to 70% more than the value of conventional milk (See table above). Thus, to be economically viable the price of milk liter paid to organic farmer needs to be 70% higher than that paid for conventional milk. In relation to recent research in Brazil, there are 239 organic dairy producers responsible for the national annual production of 6.8 million liters from 2,070 cows. The milk production per cow is 3,313 liters per year with a daily average of 11 liters.

This article will focus on some technologies developed and adapted by Embrapa and some institutional partners which aimed to provide results of research for solving bottlenecks identified for organic milk production, such as legislation organization and technologies for nutrition and health of livestock in organic farming. In the last years, a major effort has been done for adaptation and validation of the main results of research related to systems for dairy organic production.

Brazilian legislation

Every product called ecological, biodynamic, natural, regenerative, biological, agroecological, permanent culture and others are considered by Organic Law as "Organic Product" (Brazil, 2003). Since January 2011 all "non-conventional" production systems have being supervised by Organic Legislation for receiving the new seal of the Brazilian Organic Conformity Assessment (SBCO) after evaluation by authorized certification institutions or organizations for conformity evaluation - OAC (Brazil, 2003). To be considered "ready for marketing and exporting as organic products" it is necessary to be certified. Certifying agencies accredited by the National Board for Organic Production (CNPOrg) provide "Seals of Quality", ensuring compliance with the standards of organic production in farms or processing industries.

Research project for organic milk production

In paralel to legislation development, a research project about organic farming for production of crops and livestock (cattle, swine, goats, sheep and chickens) has been carried out by the Brazilian Agricultural Research Corporation - Embrapa since 2003 (see former article). In this project an Organic Agriculture Network was organized on issues related to general and specific animal health, nutrition, genetic breeding and welfare aspects of organic livestock production. This network now includes many of Embrapa's Centers and research institutions located in different regions of Brazil. It has been managed by two Embrapa Centers: Agrobiology (located in Seropédica, State of Rio de Janeiro) and Swine and Chicken (Located in Concórdia, State of Santa Catarina). This network has been considered a pioneer for searching knowledge about generation, adaptation and innovation of technologies appropriate to improve livestock production systems.

Tanzania grass pasture in a mixture with Calopo

Technologies for sustainable production

Similar to any kind of animal production system, in organic dairy farming, the nutrition needs to be planned in order to supply all animal requirements. But, nutritional supplements should be free of antibiotics, hormones and anthelmintic, and the use of additives with the role of growth promoter or appetite stimulant is prohibited, as well as urea or supplements derived or obtained from genetically modified organisms or vaccines manufactured with the transgenic technology. It is recommended to supply forage from management of pastures, sugar cane, elephant grass, silage and hay.

Considering this aspect, it is important that 85% of dry matter consumed have been produced within own property and under organic system.

For pasture fertilization

a mixture of grasses and legumes is recommended and the diversification of plant species is desirable. The establishment of agroforestry systems is stimulated, such as silvopastoral, where nitrogen fixing (legumes), trees and shrubs may be associated with agricultural crops and pastures or grazing. Crops may be alternated in the same area with legume trees or shrubs being used in protein banks or as tree fences. For fertilization of these areas, depending on the extension, it is advised to use manure and organic compost as an alternative, allowing the use of lime to correct soil acidity. As sources of phosphorus and potassium, the use of thermo solar salts (phosphate and potassium), natural rock phosphate and rock dust is allowed.

A. Management of pastures

Several experiments were carried out in Seropédica (State of Rio de Janeiro) for evaluation of pasture production under organic system to assess what would be recommended. The first evaluated was Tanzania grass pasture (Panicum maximum cv. Tanzania) in a mixture with the legume Calopo (Calopogonium mucunoides Desv), which showed that it is a viable alternative for improving pasture nutritional quality. The introduction of this legume promoted an increase in DM (dry matter) yield and CP (crude protein) content of Tanzania grass in all growing seasons evaluated. In the first and second year of cultivation, the concentrations of NDF (neutral detergent fiber), ADF (acid detergent fiber), hemicellulose and cellulose in Tanzania grass were not influenced by association with the Calopo. However, from the third year, differences in the levels of ADF, lignin, hemicellulose and cellulose were found. There was an increase of 65% in the protein value and dry matter production of Tanzania grass pasture in a mixture with Calopo. However, because of the lack of yield persistence of this system, the recovery of the pasture area with reintroduction of grass and legume was necessary after 3 years. This was also observed in conventional systems.

In another experiment, conducted at the Embrapa's experimental fields, the production of elephant grass (Pennisetum purpureum Schum. cv Cameroon) in a mixture with Siratro (Macroptilium atropurpureum (DC) Urb) and sugar cane inter-cropped with pigeonpea (Cajanus cajan) were also evaluated. The elephant grass was used as forage supplement for dairy cattle during the dry period.There was a positive effect of the legume on dry matter production of Elephant grass under the organic system, but no significant changes in it's chemical composition.

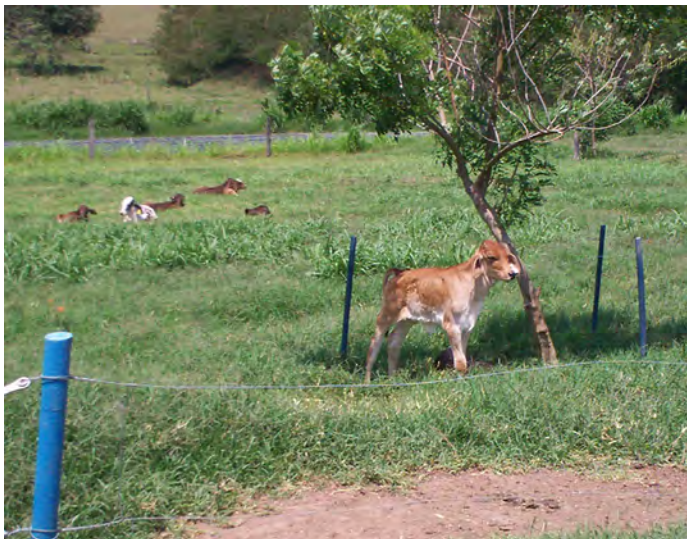
One other aspect detected was the increase in protein value, quality and production of elephant grass in a mixture with Siratro and the yield stability within 3 years of assessment. However, the recovery of the area with reintroduction of grass and legume is necessary, especially when elephant grass is managed by cutting and where the removal of nutrients is very high.

In nutritional terms, the Elephant grass, managed in a mixture with Siratro, was sufficient for cow maintenance and production, especially during the dry season, when it was used as a pasture supplementation.

With respect to a mixture

Elephant grass in a mixture with Siratro.

of sugarcane with pigeonpea, no differences were observed for NDF, hemicellulose and cellulose, when the plants in a mixture were compared to sugarcane and pigeonpea cultivated alone. Differences were observed only for values of ADF and lignin. The ADF content of pigeonpea cultivated exclusively (49.81%) was higher than that of sugarcane alone (42.54%) and similar to that found for the mixture (45.95%). This high concentration of ADF in pigeonpea is an intrinsic trait of legume forages.



B. Nutritional balance of the production system

Evaluation of dry matter, crude protein and energy intake by animals within the system of organic milk production indicated that crude protein requirements for maintenance of 505 kg of live weight and production of 10 liters of milk/cow/day were not reached using pasture supplemented with cut grass in the dry season and during the rainy season only energy requirement was reached.

Measuring dry matter and crude protein intake by grazing and pasture supplementation, it was possible to identify the level of supply of these nutrients for optimal animal nutrition and reducing production costs, as well as for demonstrating that the alternative management of pastures in organic systems can maintain an acceptable level of animal production and also contributes for reduction of external inputs and environmental impact and contamination of food.

C. Health Management

In relation to sanitary management within organic farming, the veterinary treatment is considered as a supplement and not a substitute of the good management practices. However, when it is necessary the use of herbal medicine and homeopathy are recommended.

All vaccines mandated by national law and vaccinations and tests for diseases specific to each region need to be done. For preventing ecto and endoparasites, rotational grazing and the use of medicinal herbs within ration or mineral salt are recommended. For prevention of ticks and fly larvae, research has been evaluating biological control with satisfactory results. In addition, there are preventive measures for parasite control, as the maintenance of the slurry tank covered and protected from flies.

For monitoring the herd sanitary condition, fecal egg counting (FEC) was used and the results showed that among cows the FEC was below to 250, which means a low infection. Among calves, the FEC ranged from 250 to 800, featuring medium to moderate infection. Animals younger than six months showed significantly higher FEC than those with six or twelve month-old. Higher levels of infection were observed during late spring and summer. The handling used for 0-12 month-old dairy calves in the organic production system was able to keep them with low to moderate levels of infection where the parasite load does not cause clinical disease, indicating the occurrence of parasite control by using pasture rotation system.

The management by rotational grazing aims to avoid animals to be exposed to high loads of helminth, since the period of reoccupation is not enough to place new infestations with helminthic eggs and protozoan oocysts in contact with the feces of adult cattle. However monitoring should be constant to prevent possible outbreaks of helminthiasis in calves under the age of six months kept in an organic milk production system, especially during the seasons of spring and summer.

Management practices adopted in the organic production system were able to keep the animals at moderate levels of infection for eggs and oocysts, indicating that parasite control is effective by the use of a pasture rotation system.

Final Thoughts

One of the greatest challenges for agricultural research in Brazil is to find out a way for maintaining food production at levels to support a growing population without increasing environmental degradation. In this case, dairy production within organic farming may be an option.

Furthermore, it should be a way for dairy farmers to overcome the economic crisis imposed by the market, because the product diversification, reduction of production seasonality, improving the distribution of farm incomes throughout the year help to aggregate value to the dairy product with a better economic return to dairy farmers.

On the other hand, technologies adequate for organic production in Brazil is still being developed and there is a great demand for training, validation and socialization of technologies for the national productive sector that meets the general guidelines of organic production and also the organic famer desires.

Focusing on sustainability of the system with the integrated use of these technologies validated in different biomes of Brazil, we believe that it should be possible to produce organic milk in Brazil not only avoiding the use of chemical fertilizers, pesticides, transgenic or biotechnology that impact the environment, but also reducing external inputs of the property.

Mokichi Okada Research Center – Agricultural research and development to promote farmers prosperity and consumers health

By Luiz Carlos Demattê Filho, Mokichi Okada Research Center, Brazil

Mokichi Okada Research Center, carry out research in agriculture and livestock based on Nature Farming, an agricultural model advocated by Mokichi Okada (Japan, 1882-1955).

Our activities encompass three main approaches: soil natural fertility and resilience capacity; organic seeds bred for the organic market and agroecological productions and nutrition and welfare handling of the livestock systems.

Overview of the Mokichi Okada Research Center and Korin Ltda located in Ipeuna city, 190 km far from Sao Paulo

According to FAO, there will be 9 billion people living on earth by 2050. In order to fulfill the food demand from the world population, the agricultural activities have to reach a balance between the production of foods and fibers and the preservation of the environment, which has been strongly harmed by the current conventional agriculture model.

Moreover, the worldwide engagement in renewable energy sources has led agriculture to be a significant energy producer, especially biofuel. However, the necessity for farmland expansion to cultivate these plants has been causing a strong competition with the food production areas. The heavy impact on the social and environmental issues, as well as the (troubles)/negative impact on consumers and farmers' health, requires a broad discussion.

Research areas

Driven by this enormous challenge, Mokichi Okada Research Center carry out agricultural research, aiming towards the efficient use of biomass, the adjustment of soil chemical, physical and biological properties, bioavailability of nutrients from soil, as well as the alternative control of plant pests and diseases. Moreover, vegetable and grain seeds adapted for the agro-ecological model are bred.

In livestock production, research is focusing on the welfare criteria and nutritional strategies to reach animal's safety and reliability in order to achieve a perfect immunological system, allowing the animals to naturally overcome health challenges, without the use of antibiotics, chemotherapy and growth-promoters.

Nature Farming

The research is based on the agricultural model refer-

Experiments conducted by Agricultural soil research section with regional partnership - citrus farmer

Tomatoes cultivated in the experimental area of Mokichi Okada Research Center to organic seeds production.

Vegetables and greens cultivated in the experimental area using Nature Farming concepts.

red to as Nature Farming, advocated by a Japanese philosopher and spiritualist, Mokichi Okada (1882-1955), who undertook extensive studies and practices about agriculture, politics, economy, education, art, moral, medicine and religion.

Okada's method comprises a theoretical base that favors human health and sets the environment as an intrinsic part of the productive process. The most important thing for people is to understand and to apply the processes that occur in native ecosystems, as a keystone to achieve the suitable crop yield and high quality food by soil improvement.

Mokichi Okada said that the Earth's core radiates the energy that promotes vigour and fertility of the soil and the nitrogen demand of all plants can be supplied by natural processes from the soil. Therefore, applying soluble chemical fertilizers and livestock manures, even from composting, is unnecessary and that is a big mistake for soil health. Such inputs change the functional property of the soil, compromising the soil crop yield capacity leading it to complete exhaustion. He also stated that the soil ecosystem becomes more specialized to plant species, when it is cultivated repeatedly in the same place.

Mokichi Okada was very concerned to engage consumers and farmers into a sustainable model for agriculture and food production, integrating them into an important value chain, providing prosperity to the rural population and social benefits to the urban population ensuring health and welfare for them.

Mokichi Okada Research Center

The research activities are carried out in the laboratory, under controlled conditions in the green houses and on the field. The field experiments are conducted on 8 hectares belonging to the Research Center, which is certified according to the Brazilian organic farming rules. There are trials with grain cropping, orchard, greenhouse vegetables, seedling nursery and processing and storing seed.

The research projects have multi-disciplinary features, which are conducted by researchers from several areas, working in the laboratory and on field. The laboratory is structured to attend the research project's analysis demand such as soil microbiology, chemistry and physics. Some experiments are performed on the partnership farmer's land, which has been contributed to carry out the tests and at the same time learning about the agroecological methods.

Agricultural Research Section

The work is focused on soil studies and the main objective is to propose and test agronomic techniques and practices which can rebuild the soil and natural qualities: physically stable, chemically balanced and biologically active. These goals are divided into three areas:

Soil and plant microbiology and biochemistry – studies about rhizospheric and phyllosphere microorganisms and impact assessment from agrochemicals on its activities in order to formulate a strategy for plant management and soil improvement;

Soil chemistry and plant nutrition – studies of soil chemical features and tests of alternative sources and applications to supply mineral nutrients, focused on avoiding disturbance of soil biological mechanisms;

Phytopathology and Agricultural Entomology – studies of alternative ways and phytosanitary inputs in order to promote the balance between plant pests and diseases and natural predators.

Corn cultivated in the experimental area of Mokichi Okada Research Center to organic seeds production.

Plant Breeding Research Section

The research aims to develop organic seeds of grains and vegetables with quality, flavor and pests and disease resistance based on the agroecological model. The purpose is to meet the growing market demand for organic products.

Cucumbers cultivated in the experimental area of Mokichi Okada Research Center for organic seed production.

Animal Research Section

The research in animal production is focusing on new nutritional strategies, animal welfare, and innovative livestock systems. The research is mainly carried out in experimental chicken houses and in partnership with contract-growers from Korin.

Korin Agropecuária Ltda. is a pioneer Brazilian company which produces chicken meat and eggs free from antibiotics, chemotherapy, growth-promoters, anticoccidians and with no animal by-products in the diet.

The nutrition research is performed by trials with probiotics, organic acids, plant extracts, essential oil and enzymes. In this regard, the examples from Denmark and Sweden, on the control and prohibition of antibiotics as growth-promoters since the 90s have greatly influenced our work.

Okada Research Center and Korin leading nutrition research for broilers

Effect of alternative fertilization on the productive and qualitative performance in recovering degraded pastures

By Dayana Cristina de Oliveira Pereira and Sérgio Kenji Homma, Mokichi Okada Research Center, Brazil
Co-authors: Cesar Augusto Pecoraro, Rodrigo Henriques Longaresi and Thiago Andrade Martins, Mokichi Okada Research Center, Brazil.

Brazilian pastures have been showing a fast and accentuated decline in their productive capability due to degradation. In order to evaluate new recovery technologies, this project tests two types of fertilization: conventional and alternative in a degraded pasture.

Alternative fertilization, based on the principles of Nature Farming, is a promising long term strategy for pasture recovery combining productivity with the conservation of soil quality and the environment.

Collecting data on soil compaction in the experimental area.

Cattle raised currently takes up 170 million hectares of pasture in Brazil. A great part of this land has been experiencing a quick and accentuated decline in its productive capacity due to degradation processes which limit or inhibit the activity.

In the Brazilian central region the productivity of about 80% of the pastures is not compatible with the local ecological condition. This illustrates well the economic impact and relevance of the process of pasture degradation nationwide.

Escalating use of inputs

The escalating use of inputs in agricultural production generates a vicious cycle: the greater the use, the greater the unbalance caused and the greater the need of further use in even greater dosages of formulations of greater toxicity. In face of this scenario, the use of fertilizers, with lower solubility becomes an interesting alternative. With a greater residual effect, it may lessen the variation in quantity and quality of forage produced during the course of one year.

Conventional and alternative fertilization

Aiming to study soil management alternatives based on the ideas of Nature Farming, the Mokichi Okada Research Centre set up, in 2009, an experiment in order to compare conventional and alternative fertilization in the process of recovering pasture land.

The test area was a two-hectare pasture with Brachiaria decumbens Stapf in Rio Claro – São Paulo – Brazil.

During three years the chemical, physical and biological soil parameters and the chemical bromatologic parameters were evaluated. In this work only the last one will be discussed.

Grazing and grass samples

The animals were allowed into the grazing area 70 days after the beginning of the treatments. They were taken to the pastures when the forage was between 35 and 40 cm in height, and taken out when the grasses were between 15 and 20 cm tall.

Grass samples were collected 5 cm from the soil eight months after the treatment when three grazing periods had taken place. The samples were taken to the laboratory to determine

Grazing cattle in the experimental area of a partner farmer.

Table 1 – Mean productivity and bromatological analysis (average): dry matter (DM), pure protein (PP), fibre in neutral detergent (FND) and fibre in acid detergent (FAD), pure fibre (PF), ethereal extract (EE) and ashes (As) in Brachiaria leaves. Rio Claro – SP – Brazil (2010).
Alternative fertilizers (AF): a fermented mixture of 65% rice bran and 35% of castor bean bran (2.5% N, 2% P2O5, 1% K2O) (100 kg/ha); castor bean bran (5% N)(200 kg/ha); thermophosphate (17.5% P2O5) (300 kg/ha) and potassium sulphate (48% K2O)(40 kg/ha) per year. 2. Conventional fertilizers (CF): superphosphate (20% P2O5)(111 kg/ha); potassium chloride (60% K2O)(52 kg/ha) and urea (45% N)(133 kg/ha) per year.

Treatments	DM (t/ha)	PP (%)	FND (%)	FAD (%)	PF (%)	EE (%)	As (%)
AF[1]	4.27a	7.09a	69.34a	28.99b	0.10 a	1.22 a	7.08a
CF[2]	4.98a	7.01a	70.20a	35.98a	0.06a	1.08b	6.45a

**Averages followed by the same letter in the columns do not differ statistically by the t test at 5% significance - statistical software R® version 2.10.0. 1.*

the contents of dry matter (DM), pure protein (PP), ashes (As), pure fibre (PF), fibre in neutral detergent (FND) and fibre in acid detergent (FAD) and ethereal extract (EE) according to the methodology of Silva (2002).

Productivity was determined based on dry matter using a metal square with an internal area of 0.5m2 randomly thrown in each experimental area with 10 repetitions. The means were compared and analysed statistically.

The alternative fertilization treatment had a lower fibre content in acid detergent and a higher ethereal extract content compared to conventional fertilization (Table 1), thus producing better quality foraging since greater amounts of FAD are consumed in smaller quantities. According to Nussio (1998), FAD contents higher than 40% are enough to decrease grazing by the animals.

FAD decreased with more nitrogen

Working with nitrogen doses with Panicum maximum Jacq, Gargantini (2005) noticed a decrease in FAD content as nitrogen dosage increased. The same results observed in the alternative fertilization treatment may be due to the use of inputs with slower release and greater residual effect.

The production of dry matter (DM) and the contents of pure protein (PP), pure fibre (PF) and fibre in neutral detergent (FND) all had the same statistical performance on both fertilization strategies testes. According to Raij (1991), the protein content is directly related to the availability of nitrogen to the plants.

We expect that alternative fertilization may, throughout the experiment, maintain the foraging quality as well as preserve the environmental attributes since the use of nutritional supplements with slower and gradual release favors the soil microbiota in regulating soil structure and nutrient availability.

Grazing cattle in the experimental area of a partner farmer.

Different fertilization systems

The experimental area was divided in two and in each hectare a different fertilization system was used, thus establishing two treatments:

- Alternative fertilization (AF): pasture management followed the concepts of Nature Farming, where less soluble fertilizers were used such as castor bean meal, potassium sulphate and thermophosphate (Yoorin® B/Zn), basalt dust, boric acid, copper sulphate and manganese sulphate as nutrient sources of slow release and activators of the soil microbiota;

- Conventional fertilization (CF): the usual pasture management techniques according to Raij et al. (1991) were followed with the use of urea, simple superphosphate and potassium chloride.

Alternative fertilization - a promising strategy

The adoption of an alternative fertilization management based on the concepts of Nature Farming may be a promising strategy for recovering pastures because it will produce good quality foraging as well as collaborate in the formation of a model of sustainable agriculture.

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Preventing disease and parasites in organic pig herds

By Kristian Knage-Rasmussen, Department of Animal Science, Aarhus University

Pig health varies between organic pig herds in Europe. The variation is likely to be caused by different management routines in the herds. The use of antibiotics and anti parasite medicals is unwanted in organic farming, which is why prevention of disease and parasite control is in focus to improve animal welfare.

Therefore, it is important to investigate the relation between management and parasite/disease occurrence, and based on this, to develop management tools, which farmers can use to improve the herd health.

Problem areas in European organic pig farming

The objective of the project was to contribute knowledge about the interaction between management in herds and disease occurrence, and to implement this knowledge in an applicable tool that farmers can use to improve the animal health on herd level.

Based on a literature study, a survey as well as expert opinions by scientists from all over Europe, the following focus areas were identified as being of crucial importance for organic and free range pig health: parasite control, farrowing and reproduction problems, piglet mortality, and weaning diarrhea.

A survey including 101 organic herds from six European countries provided a status on the health and welfare in organic pig production. The characterization included differences in national legislation or concept criteria for organic production as well as national differences in interpretation of the common European legislation for organic production. As shown in table 1, diversity in organic production systems throughout Europe was found.

New tools developed for health control

Four generic HACCP inspired management tools for surveillance and control were developed; one for each of the four focus areas: parasites, piglet mortality, weaning diarrhoea, and sow farrowing and reproductive problems. The tools are based on the HACCP idea – that most important hazards should be addressed through risk factors. The generic tool development included identification of potential risk factors and belonging suggestions for corrective actions based on the literature review and scientific expert knowledge. Risk factors' weights were added to the tool based on scientific and national production expert advice. Farm individual management plans, including highlighting of focus areas and suggestion of corrective actions, are produced from

Age	Indoors with concrete outdoor run	Outdoor paddocks (with access to huts or stables)	Woodland (with access to huts or stables)	Indoors
Gestation sows	Austria, Germany	Denmark, France Sweden, (Italy)	Italy	(France)
Lactatation sows and pgiets	Austria, (Germany)	Denmark, France Sweden, (Germany, Italy)	Italy	Germany, (France)
Weaning pigs	Austria, Germany, Denmark	Italy, Sweden, (Denmark, France)	Italy	France, (Italy)
Finishers	Austria, Germany, Denmark	Sweden, (Germany, Italy)	Italy	France, (Germany)

Table 1 Primary (and secondary) common organic housing systems for different age groups in six European countries

interview
barn
both

CORE Organic

Piglet Mortality HACCP

farm:
date:
observer:

Questionnaire

	keyword				remarks
records					
	total mortality	Is your total piglet mortality (stillbirths plus losses before weaning) <16%?	x	yes	= there is no problem
				no	
	seasonality	Does total mortality change over different seasons?		yes	
			x	no	
	born dead	Do you have >10% of piglets born dead?		yes	
			x	no	

Figure 1. Tool input. Example of questionnaire and check list information, which are used for generating an individual herd risk profile - The focus area "piglet mortality" is used as an example.

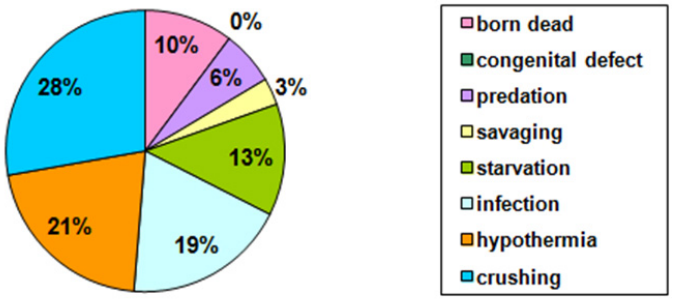

Figure 2. Tool –output: Example of herd individual herd chart specifying causes for a herd specific problem. The focus area "piglet mortality" is used as an example.

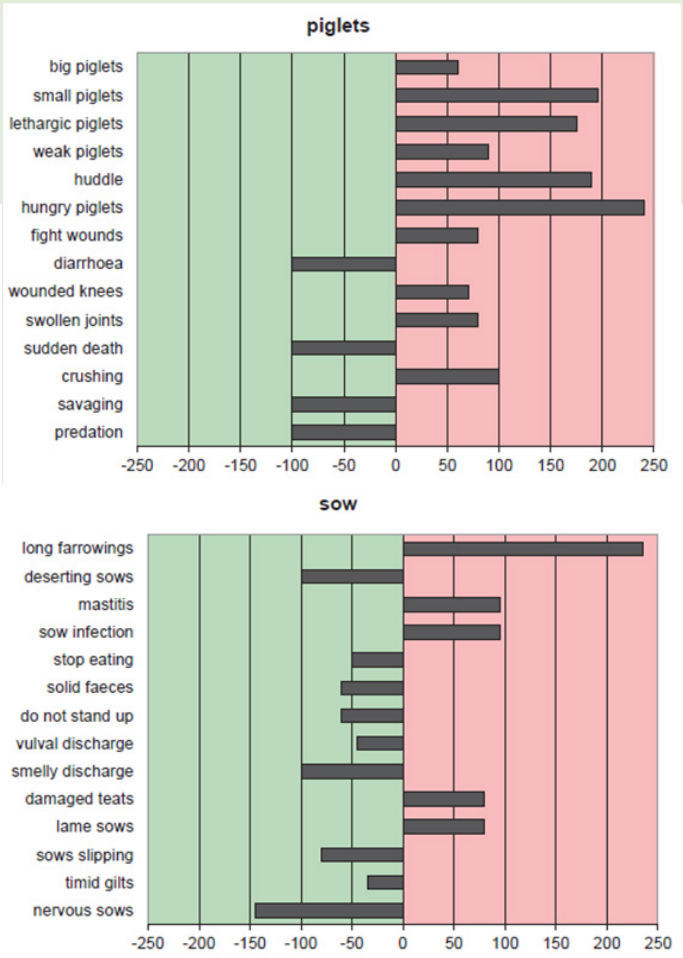

Figure 3. Tool –output: Example of herd individual strengths (bars to the left in green area) and weaknesses (bars to the right in red area). The focus area "piglet mortality" is used as an example.

focusing the generic – gross - system to farm individual circumstances – identified by farmer interviews and check list information.

The way the tools work

The health control tools are assessable as Microsoft Excel® and can be used on a PC with Microsoft Excel®2003 installed. The tool input is based on a questionnaire and a check list, which are answered on the farm, and generates a herd specific risk profile. The output is illustrations that show herd strengths and weaknesses as a here and now status. Examples are given in Figure 1, 2, and 3.

Furthermore, two lists are generated:

1. a positive list focusing on management routines that decrease problems and which are already implemented in the herd.

2. a list of challenges with new management procedures that should be implemented on the farm to decrease the problem.

It is suggested that the farmer, and maybe his adviser, should pick out new management procedures that he/they think are practical and economically possible to implement in the herd. Normally, we suggest that two-four new management procedures are implemented.

Experiences so far

The health control tools have been used on eight Danish, eight German, and eight Austrian organic pig herds. The farmers' opinion on the tools' usefulness varies, but in general it was positive.

The farmers were also asked to decide who should use the tools in the future. The farmers thought, in general, that the tools should be used by a production adviser or in collaboration between the farmer and the adviser.

The importance of the project result for agriculture and society

The knowledge of risk factors of organic pig disease could be used to improve animal health in organic pig production. In general, this could be induced by developing new production systems and management routines for organic pig production.

Furthermore, the organic pig producers should find the developed management tools effective and useful in the daily work for improvement of animal health and welfare in their herds.

Read more

Find more information about the CorePig project at www.coreorganic.org and in Organic Eprints: http://orgprints.org/view/projects/COREPIG/.html

Publications

EU Presidency article: Organic for the future

Europe faces major challenges to conserve biodiversity, secure soil, and promote animal welfare and there is an urgent need to ensure global food security.

Organic food and farming paves the way to meet these challenges; but to succeed a further development of organic food and farming is key. On occasion of the Danish EU Presidency, ICROFS has written an article to promote the awareness of organic research and development.
Read the article in the Parliament Magazine: http://viewer.zmags.com/publication/31fc1b26#/31fc1b26/107

Ecology & Farming magazine

The latest edition of the Ecology & Farming magazine is available at the following link: www.ifoam.org/public/Ecology_and_Farming/ecologyandfarming_0511.pdf

If you wish to receive Ecology & Farming as a hard-copy, please contact publications@ifoam.org for information on how to subscribe.

Go to Ecology and Farming website.

Congresses

The 4th International conference on the organic development in Central/ Eastern European and Central Asian countries

the 4th International conference will be held in Izmir, Turkey on April 13 - 14, 2012 with excursions on April 12 nad 15.

The conference will focus on organic farming and how to maintain and improve its integrity. Experiences and challenges in organic quality assurance along the product chain will be discussed from the point of view of producers, processors and certifiers.

The conference will be held in parallel to the organic trade fair Ecology Izmir. Read more at http://turkey.organic-conference.info/home.html

6th European Organic Congress Copenhagen, Denmark, 17-18 April 2012

The 6th European Organic Congress is held in Denmark, Copenhagen 17-18 April. The congress involves high level panel discussions with policy makers and experts from across the organic and agricultural sectors, workshops, coffee and lunch breaks as well as a gala dinner on April 17th.

There will also be an opportunity to take part in an organic excursion on the 16th of April, which includes visits to organic farms, an organic bakery, a producer of public procurement and retail store.

Read more at http://www.icrofs.org/pdf/6EOC_180112.pdf

The 2nd African Organic Conference 2-4 May 2012, Zambia

This conference, held in Lusaka, Zambia, will promote mainstreaming of organic agriculture in African Government policies, in African intergovernmental organizations as well as among development partners. It will provide evidence on the benefits of organic agriculture and its contributions to the challenges and needs in Africa.
Read more: http://www.africanorganic-conference.com/images/papers/aoc2fli-erfeb2012.pdf

Congresses

10th European IFSA Symposium 1-4 July 2012, Århus, Denmark

Producing and reproducing farming systems: New models of organisation for sustainable food systems of tomorrow

The International Farming Systems Association (IFSA) – European Group is a lively network consisting of dedicated researchers and scholars from various fields of research and practices.

IFSA is concerned with sustainable development of agriculture from a systemic perspective. Being no formal membership association, all who participate in the biennial symposia are considered part of the IFSA family.

The IFSA European Group Steering Committee and the local Organisation Committee are now looking forward to the 10th symposium to be held in Aarhus, Denmark. We welcome you to a fruitful and inspiring meeting dealing with contemporary and emerging questions and challenges to the development of sustainable farming systems.

Read more: http://ifsa2012.dk/

Meetings

SOLID meeting in Bologna

The stage is set for the next meeting of the partners of the SOLID project. This time, it will be held in Bologna, Italy, April 26-27, 2012, and co-arranged by ICEA.

Particularly, there will be a Stakeholder Platform meeting on Friday 27. April, where the SOLID project dissemination plan and stakeholder involvement will be discussed with European organic sector representatives.

The SOLID project on Sustainable Organic and Low Input Dairying is an EU FP7 project running for five years. Read more at www.solidairy.eu.