

## ORGANIC AGRICULTURE IN GEORGIA

**M.P. Jorjadze\*, T.T. Urushadze\*\***

**\*Biofarming Association "Elkana"**

*16, Gazapkhulis Str., Tbilisi, 0177, Georgia: director@elkana.org.ge*

**\*\*Agricultural University of Georgia**

*240, David Agmashenebeli Ave., Tbilisi, 0159, Georgia: t.urushadze@agruni.edu.ge*

Received: 22.08.15; accepted: 09.10.15

The article provides brief information on the conception of organic agriculture and the basic principles of its functioning. It is shown that the most promising trend of directing agriculture in Georgia is associated with the Biological Farming Association Elkana. The organization, which was founded as early as 1994, by its energetic activity has gained high prestige among the broad sections of the public. Elkana's activity enabled to fill up the information gap and agricultural workers have now a clear understanding of how to ensure the production of safe farming products. Together with the development of organic agriculture, an independent system of certification has been established and recognized at the European market. A successful international conference on organic agriculture was arranged and held in 2009. Since 2006 the Ecological Farming and Nature Conservation Department has been successfully functioning at the Georgian State Agrarian University, which is engaged in research work and training of future cadres, and successfully cooperates with Elkana.

For opinion of P. Kristiansen and C. Marfield [1] the term "organic" was first used in relation to farming by L. Northbourne [2] in 1940 in the book "Look to the Land". He wrote "the farm itself must have a biological completeness; it must be a living entity, it must be a unit which has within itself a balanced organic life". According D. Lotter [3], Northbourne was not simply referring to organic inputs such as a compost, but rather to the concept of managing a farm as an integrated, whole system.

Product quality greatly depends on soils quality, condition by soil management practice adopted by a farmer. Continuous harvesting of crops interrupts the organic matter cycle and depletes nutrients in the soil [4-10], often resulting in very low soil organic matter content

[11]. Degraded soil quality, expressed as poor surface soil aggregation, high bulk density, low porosity, and slow infiltration, limits agricultural productivity and increases nonpoint source pollution of surface water via agricultural runoff [12]. Hence such ecosystems are very vulnerable and often fragile [13], consequently cannot lead to sustainable agricultural production.

There are different understandings of sustainability in agricultural systems, but all agree that sustainable production must be achieved. According to J. Ikerd [14] sustainable agriculture means system being able to maintain productivity and benefit for society for a long time. It must

be ecologically acceptable, energy saving, economically viable, socially supportive and commercially competitive. According to many scientists for today ecological (also known as organic and biological production) agricultural practice is considered to be the most sustainable among the existing systems being able to reduce negative impact on environment and maintain it for a long time [15] what excludes possibility of application of most synthesized chemicals both in plant growing and livestock breeding [16].

Organic farming has been expanding at annual rate of ha 20% in the last decade [17], accounting for over 24 million hectares worldwide [18] and has become a mainstream practice for some crops.

In comparison with conventional farming, organic farming has potential benefits in promoting soil structure formation [19], enhancing soil biodiversity [20], alleviating environmental stresses [21], and improving food quality and safety [22]. Because nutrient supply and pest control largely depend on organic inputs and biological processes in organic systems [23], organic farming avoids the inputs of synthetic chemicals and their consequences [24].

Soil quality is a necessary indicator of sustainable land management [25]. It has been suggested that organic farming systems are "a valid alternative approach", which deliver agronomic and environmental benefits, particularly

with regard to the improvement of soil quality [26].

Soil fertility management in organic farming relies on a long-term integrated approach rather than the more short-term much targeted solutions common in conventional agriculture [27]. Increasing soil organic matter content through the addition of organic amendments has proven to be a valuable practice for maintaining or restoring soil quality [28].

Organic agriculture relies greatly on building soil organic matter with compost typically replacing inorganic fertilizers and animal manure as the fertility source of choice [29].

According Edith Lammerts van Bueren and Hank Verhoog [30] in ethical discussion about the application of biotechnology techniques, it is genetic engineering that attracts big attention. It is very important, that the International Federation of Organic Agriculture Movements (IFOAM, 2002) is opposed to genetic engineering in agriculture in view of the unprecedented danger it represents for the entire biosphere and the particular economic and environmental risks it poses for organic products. The reasons mentioned by IFOAM can be clustered into three groups:

1. Risks for human health and the environment:
  - ✓ negative and irreversible environmental impacts;
  - ✓ release of organisms that have never before existed in nature and which cannot be recalled;
  - ✓ pollution of off-farm organisms;
  - ✓ unacceptable threats to human health.
2. Socio-ethical reasons:
  - ✓ pollution of the gene pool of cultivated crops, microorganisms and animals;
  - ✓ denial of free choices, both for farmers and consumers;
  - ✓ violation of farmers' fundamental property rights and endangerment of their
  - ✓ economic independence.
3. Incompatibility with the principles of sustainable agriculture.

Organic agriculture in Georgia was conceived in the early 1990s and is associated with the activities of the Biological Farming Association Elkana. Elkana is an association of farmers and people engaged in agribusiness that was founded in 1994. It is aimed at promoting the improvement of the socio-economic state of Georgian population and environmental protection by development of sustainable bio-farms and self-activation of rural population [31,32].

The Association Elkana views the development of the sector of organic agriculture very important for the country, because Georgia is a mountainous country of rich agrarian heritage, which is known for its agricultural traditions and diversity of cultural flora. The country's diverse natural conditions favor the cultivation of different crops and plants here.

Georgia is well known for the quality products it produces, such as wine, fruits and vegetables. However, complex mountainous landscape and land fragmentation often do not allow Georgian farmers to benefit from economies of scale or compete in global commodity markets. Elkana has a vision of Georgian agriculture - which traditionally employs more than half of the total labor force of the country - as producing high value, organic products.

At a time of foundation of a Georgian NGO - the Biological Farming Association Elkana ([www.elkana.org.ge](http://www.elkana.org.ge)), the Georgian village, being completely devoid of means of production, had also an acute shortage of information and knowledge. No government or public institution capable of assisting farmers with qualified farming advice and modern technologies was functioning in the country. In order to assist Georgian farmers the Association Elkana was established whose initial activities were limited to advisory services of farmers; at present the organization's main divisions include: Advisory/Extension Service; Rural Development; Agricultural Diversity Conservation; Rural Tourism and Public Affairs (uniting the Training Centre, Publishing, Advocacy and Projects subdivisions).

A special role in the organizational development and organic agriculture expertise of Elkana has been played by German organizations (EED / Brot für die Welt, Diakonisches Werk, Misereor). Within the framework of the organic agriculture development programme funded by them for years, local cadres have been trained and good agricultural practice (advanced international experience) have been introduced in local farms.

Having started with nine member farmers in 1994 the organization works with more than 1,000 farmers at present. The association membership is open to any citizen of Georgia interested in the development of organic farming in the country, as well as the protection of the environment. Elkana encourages participation without distinction of gender, age, disability or ethnicity.

In 1996 Elkana became a member of the International Federation of Organic Agricultural Movements (IFOAM). In compliance with IFOAM standards and European Union regulations, the Association has developed and officially registered a bio-production standard, which has been subsequently updated several times. However, since 2009, based on the process of harmonization of Georgian legislation with the EU regulations, the organization has been guided by the standard defined by the EU regulations. The placing of the member farmers' products on the market with a respective status ('bio') required the establishment of a relevant legislative base and certification system. Thanks to active cooperation with the Ministry of Agriculture of Georgia and other competent authorities, a Law of Georgia on Biological Agro-production entered into force in 2006. In 2011, in parallel with entry into force of the legislation

on food safety, this law was invalidated, since, according to the office of the then Prime Minister, all the laws related to food quality had to be incorporated exactly in the regulatory framework of food safety, which was practically implemented later. The regulatory framework can be considered completed by August 2014 upon enactment of the regulation on labeling, notwithstanding the fact that no relevant technical regulations/standards were developed. Georgia recognizes international organic agro-production standards.

As regards the certification system, Elkana initiated a project “The Development of Organic Agriculture and Certification System in the South Caucasus”, which in 2002 was funded by the Swiss Agency for Development and Cooperation (SDC) and the Swiss organization HEKS-EPER with the technical support of GIZ – the organization acting on behalf of German Federal Ministry for Economic Cooperation and Development (BMZ). Within the framework of this project a bio-certification system was established in all the three South Caucasian states, whereas the certification agencies of Armenia (Ecoglobe Ltd. – [www.ecoglobe.am](http://www.ecoglobe.am)) and Georgia (Caucascert Ltd. – [www.caucascert.ge](http://www.caucascert.ge)) in 2008 were granted a certificate of accreditation by the Office of the German Accreditation System (DAP) and since the end of 2011 have been on the list of certification bodies approved by the EU regulation under the common name GREEN CAUCASUS and biological certificates awarded by them are recognized on the EU markets.

According to 2014 statistics, 0.32% (1,292 ha) of agricultural land area in Georgia is certified as ‘bio’ (area under apples, pomegranate, persimmon, grapes, cereals, legumes, essential oil plants, etc.).

In parallel with promoting the development of bio-farms, Elkana is also occupied with the problems of local agricultural biodiversity conservation and sustainable use. The organization started to work in this direction already in 1996. In 2004-2009, Elkana implemented the GEF/UNDP-funded project “Conservation and Sustainable Use of Georgia’s Agrobiodiversity”, in the framework of which old Georgian cereal and leguminous crops have been recovered and are being cultivated and propagated on farms; also collected and propagated have been local pear, apple and vine varieties.

In 2011, by Elkana’s initiative and with the financial support of the MATRA Social Transition Programme of the Embassy of the Kingdom of the Netherlands in Georgia and Armenia a small-scale project “The Conservation and Sustainable Use of Domestic Animals at Risk of Extinction in Georgia” was launched, within the framework of which the farming of Kakhetian pig, Khevsuretian (mountain) cow and Georgian chicken is under way. In 2013-2015 the project has been further financed by UNDP/GEF.

Scope of Elkana’s Activities

- ✓ sustainable & organic farming extension and training;
- ✓ conservation and sustainable utilization of agricultural diversity;
- ✓ supporting of business activities of organic farmers, farmer groups;
- ✓ rural tourism and the valorization of traditional food and wine production & processing;
- ✓ advocacy of farmers’ rights.

The sources of Elkana’s financing are grants, financial support of international organizations and the association member contributions. Within the scope of its objectives, the association cooperates with interested individuals and organization both in Georgia and abroad.

In 2006, at the Georgian State Agrarian University (GSAU), at the instigation and with financial support of the honorary doctors of the same university (President of the German Federal Agency for Nature Protection (BfN) Prof. H. Vogtmann and Prof. A. Ploeger from the University of Kassel) the Ecological Farming and Nature Conservation Department was established at the Faculty of Agronomy. The University is pioneer in this direction in the South Caucasus and among most post-Soviet universities. The department’s objective is the creation of research and training programs in the sphere of ecological agriculture (in terms of organic farming and processing) and environmental protection, where the attention will be focused on biodiversity, human health and ecosystems, promotion and development of this direction. The fundamentals of ecological agriculture as an alternative way of the sustainable agricultural development will be acquired. The department has a modern laboratory, which was founded in 2008 under the patronage and with financial support of German Prof. Heinz Ferri, honorary doctor of the University and bears his name.

In December 2006, a memorandum was made between the University and the Biological Farming Association Elkana, which objective is close cooperation for the purpose of development and strengthening the scientific, information and production-experimental base. Three graduates from the Agrarian University successfully work in Elkana, sharing their knowledge and experience with the interested persons. Georgian experts and researchers actively participate in the world’s leading trade fair for organic food annually held in Nuremberg (BioFach). The University students undergo regular probation training abroad (Germany, Poland).

On 9-11 September 2009, for the first time in the South Caucasus an international forum - “The Development of Organic Sector in the Central/Eastern European and Central Asian Countries” was held in Georgia, which was attended by 200 delegates from 22 countries. The Georgian Agrarian University hosted the event together with Elkana. The Ecological Farming and Nature Conservation

Department actively participates in research work. In 2005-2011, a project “The Establishment of Ecological Farming and Nature Conservation Department”, funded by the German Federal Agency for Nature Protection (BfN) and the University of Kassel, was successfully implemented. In 2010-2012, an international project- ”Urgent Issues of Composting under Conditions of the South Caucasus”, which financier was Heinz Ferri Ltd. (Germany), while partner organizations: the University of Kassel and the Armenian State Agrarian University, was implemented. In 2012, the first in the South Caucasus composting plant was opened in Marneuli, where an organic fertilizer – compost is produced from the domestic organic waste. The plant was arranged and commissioned under the direct leadership of Prof. Vogtmann, Prof. Ploeger and Prof. P. Frangstein. The greatest is the contribution of Prof, Heinz Ferri in the development of this trend. Two graduate students of the GSAU were retrained in the issues of composting with his financial assistance under the training course completed by Prof. Vogtmann. Today they are actively engaged in the above-mentioned enterprise. Many seminars and open lectures were held under the direct leadership of German professors in Georgia. Very interesting dissertation works of two German colleagues Andreas Ferri and Nicholas Zoller have been prepared under their direct leadership. Messrs. Andreas Ferri and Nicholas Zoller have made a great contribution in the research of composting problems, both in Kvemo (Lower) Kartli as well as throughout the entire region. They have spent great efforts to achieve the existing outcomes in the region, spent much time to conduct scheduled and interesting field trials, detail survey/study of rural population, and conduct of laboratory experiments. Today the Marneuli-grown cabbage, the quality examination of which is carried out under the German technology in the Ecological Farming and Nature Conservation Laboratory. With financing of the Shota Rustaveli National Science Foundation, a project “A Comparative Study of Conventional and Ecological Agricultural Production Systems by the Example of Vegetable Crops” was implemented in 2010-2012. The mentioned Department together with German colleagues is actively engaged in both - the research and educational activities. Prof. Vogtmann and Prof. Ploeger are invaluable and active advisors in the development, advance and progress of the Department.

#### REFERENCES

1. *Paul Kristiansen and Charles Merfield.* Overview of Organic Agriculture. In *Organic Agriculture. A Global Perspective* // CSIRO Publishing, Australia, 2006, pp.1-23.
2. *Northbourne L.* Look to the Land // Basis Books,

London, 1940, 165 pp.

3. *Lotter D.W.* Organic Agriculture // *Journal of Sustainable Agriculture*, 21 (4), 2003, pp. 53-128.
4. *Jennifer Davis and Lyn Abbott.* Soil fertility in Organic Systems. In *Organic Agriculture. A Global Perspective* // CSIRO Publishing, Australia, 2006, pp.25-51.
5. *Brentrup F., Kusters J., Lammel J., Barraclough P. and Kuhlmann H.* Environmental Impact Assessment of Agricultural Production Systems Using the Life Cycle Assessment Methodology. 11. The Application to N Fertilizer use in Winter Wheat Production Systems // *European J. of Agronomy*, 20 (3), 2004, pp. 265-279.
6. *Browne A.W., Harris P.I.C., Hofny-Collins A.H., Pasiecznik N. and Wallace R.R.* Organic Production and Ethical Trade: Definition, Practice and Links // *Food Policy*, 25 (1), 2000, pp.69-89.
7. *Drinkwater L.E., Letourneau D.K., Workneh F., Vanbruggen A.H.C., Shennan C.* Fundamental Differences Between Conventional and Organic Tomato Agroecosystems in California // *Ecological Applications* 5(40), 1995, pp. 1098-1112.
8. *Marinari S., Mancinelli R., Campiglia E., Grego S.* Chemical and Biological Indicators of Soil Quality in Organic and Conventional Farming Systems in Central Italy // *Ecological Indicators*, 6, 2006, pp.701-711.
9. *van Diepeningen A.D., de Vos O.J., Korthals G.W., van Bruggen A.H.C.* Effects of Organic Versus Conventional Management on Chemical and Biological Parameters in Agricultural Soils // *Applied Soil Ecology*, 31, 2006, pp. 120-135.
10. *Baldatoni D., Leone A., Iovieno P., Morra L., Zaccardelli M., Alfani A.* Total and Available Soil Trace Element Concentration in Two Mediterranean Agricultural Systems Treated with Municipal Waste Agriculture Systems Treated with Mineral Waste Compost or Conventional Mineral Fertilizers // *Chemosphere*, 80, 2010, pp. 1006-1013.
11. *Garcia C., Hernandez T., Costa F.* Microbial Activity in Soils under Mediterranean Environmental Conditions // *Soil Biology and Biochemistry*, 26, issue 9, 1994, pp. 1185-1191.
12. *Evanulo G., Sherony C., Spargo J., Starner D., Brosius M., Hacrting K.* Soil and Water Environmental Effects of Fertilizer-, Manure- and Compost-Based Fertility Practices in an Organic Vegetable Cropping System // *Agricultural Ecosystems Environmental*, 127, 2008, pp. 50-58.
13. *Ramos M.C.* Metals in Vineyard Soils of the Penedes Area (NE Spain) After Compost Application // *J. of Environmental Management*, 78, 2006, pp. 209-215.
14. *Ikerd J.* Two Related but Distinctly Different Concepts: Organic Farming and Sustainable Agriculture // *Small Farm Today*, 10(1), 1993, pp.30-31.

15. Wood R., Lenzen M., Dey C., and Lundlie S. A Comparative Study of Some Environmental Effects of Non-Organic and Organic Farming in Australia // *Agricultural Systems*, 89, 2006, pp.324-348.
16. Lampkin N. *Organic Farming* // Old Pond Publishing, 2002, 747 pp.
17. Lotter D.W. *Organic Agriculture* // *J. Sustainable Agriculture*, 21(4), 2003, pp.48-59.
18. Willer H., Yussefi M. (Editors). *The World of Organic Agriculture – Statistics and Emerging Trends – 2004* // International Federation of Organic Movements, Bonn, 2004, 125 pp.
19. Pulleman M., Jongmans A., Marinissen J. and Bouma J. Effects of Organic Versus Conventional Arable Farming on Soil Structure and Organic Matter Dynamics in a Marine Loam in the Netherlands // *Soil Use Manage*, 19, 2003, pp.
20. Oehl F., Sieverding E., Mader P., Dutois D., Ineichen K., Boller T., Wiemken A. Impact of Long-Term Conventional and Organic Farming on the Diversity of ArbuscularMycorrhizal Fungi // *Oecologia*, 138, 2004, pp. 574-583.
21. Macilwain C. Organic: is it the Future of Farming ? // *Nature*, 428, 2004, pp.792-793.
22. Reganold et al. Sustainability of Three Apple Production Systems // *Nature*, 410, 2001, pp. 926-929.
23. Rigby D., Caceres D. Organic Farming and the Sustainability of Agricultural Systems // *Agricultural Systems*, 68, 2001, pp.21-40.
24. Tu C., Ristaino J.B., Hu S. Soil Microbial Biomass and Activity in Organic Tomato Farming Systems: Effects of Organic Inputs and Surface Mulching // *Soil Biol. Biochem.*, 38, 2006, pp. 247-255.
25. Herrick J.E. Soil Quality: an Indicator of Sustainable Land Management // *Applied Soil Ecology*, 15, 2000, pp.75-83.
26. Stockdale E.A., Shepherd M.A., Fortune S., Cuttle S.P. Soil Fertility in Organic Farming Systems – Fundamentally Different // *Soil Use and Management*, 18, 2002, pp. 301-308.
27. Marinari S., Mancinelli R., Campiglia E., Grego S. Chemical and Biological Indicators of Soil Quality in Organic and Conventional Farming Systems in Centrak Italy // *Ecological Indicators*, 6, 2006, pp. 701-711.
28. Wander M.M., Walter G.L., Nissen T.M., Bollero G.A., Andrews S.S. Cavanaugh-Grant S.A. Soil Quality: Science and Process // *Agronomy J.*, 94, 2002, pp. 23-32.
29. Evanylo G., Sherony C., Spargo J., Starner D., Brosius M., Haering K, Soil and Water Environmental Effects of Fertilizer-, Manure- and Compost – Based Fertility Practices in an Organic Vegetable cropping System // *Agriculture, Ecosystems and Environment*, 127, 2008, pp. 50-58.
30. Edith Lammerts van Bueren and Hank Verhoog. Organic Plant Breeding and Seed Production: Ecological and Ethical Aspects. In *Organic Agriculture. A Global Perspective* // CSIRO Publishing, Australia, 2006, pp.123-139.
31. Urushadze T.T., Ghambashidze G.O. Ecological Agriculture, History and Perspectives of Development // *Problems of Agrarian Science*, 37, 2006, pp.8-11.
32. Urushadze T.T., Ghambashidze G.O., Tkheldze A.T., Khomasuridze D.R., Nikoleishvili N.T. Soil Fertility Management in Organic and Conventional Farms // *Annals of Agrarian Science*, vol. 11, No 4, 2013, pp.49-52.

## ОРГАНИЧЕСКОЕ СЕЛЬСКОЕ ХОЗЯЙСТВО В ГРУЗИИ

М.П. Джорджадзе, Т.Т. Урушадзе

В статье дана краткая информация о зарождении органического сельского хозяйства и основных принципах функционирования. Показано, что в Грузии ведение этого исключительно перспективного направления сельского хозяйства связано с ассоциацией биологических хозяйств "Элканы". Эта организация, которая была сформирована еще в 1994 году, своей активной деятельностью завоевала заслуженный авторитет среди широких слоев населения страны. Деятельностью этой организации был снят информационный вакуум и работники сельского хозяйства имеют ясное представление как можно обеспечить получение здоровых сельскохозяйственных продуктов. Особенно следует отметить внедрение системы сертифицирования и то, что выданный у нас биосертификат признан на европейском рынке. С 2006 года в Аграрном университете Грузии успешно функционирует отделение экологического сельского хозяйства и охраны природы, которое обеспечивает проведение научных исследований и подготовку будущих кадров и успешно сотрудничает с "Элканы".



**Fig.** Some activities of the Biofarming Association „Elkana“