INDO-ISRAELI BUSINESS

NEW MEDIA
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EXPLORING NEW VISTAS

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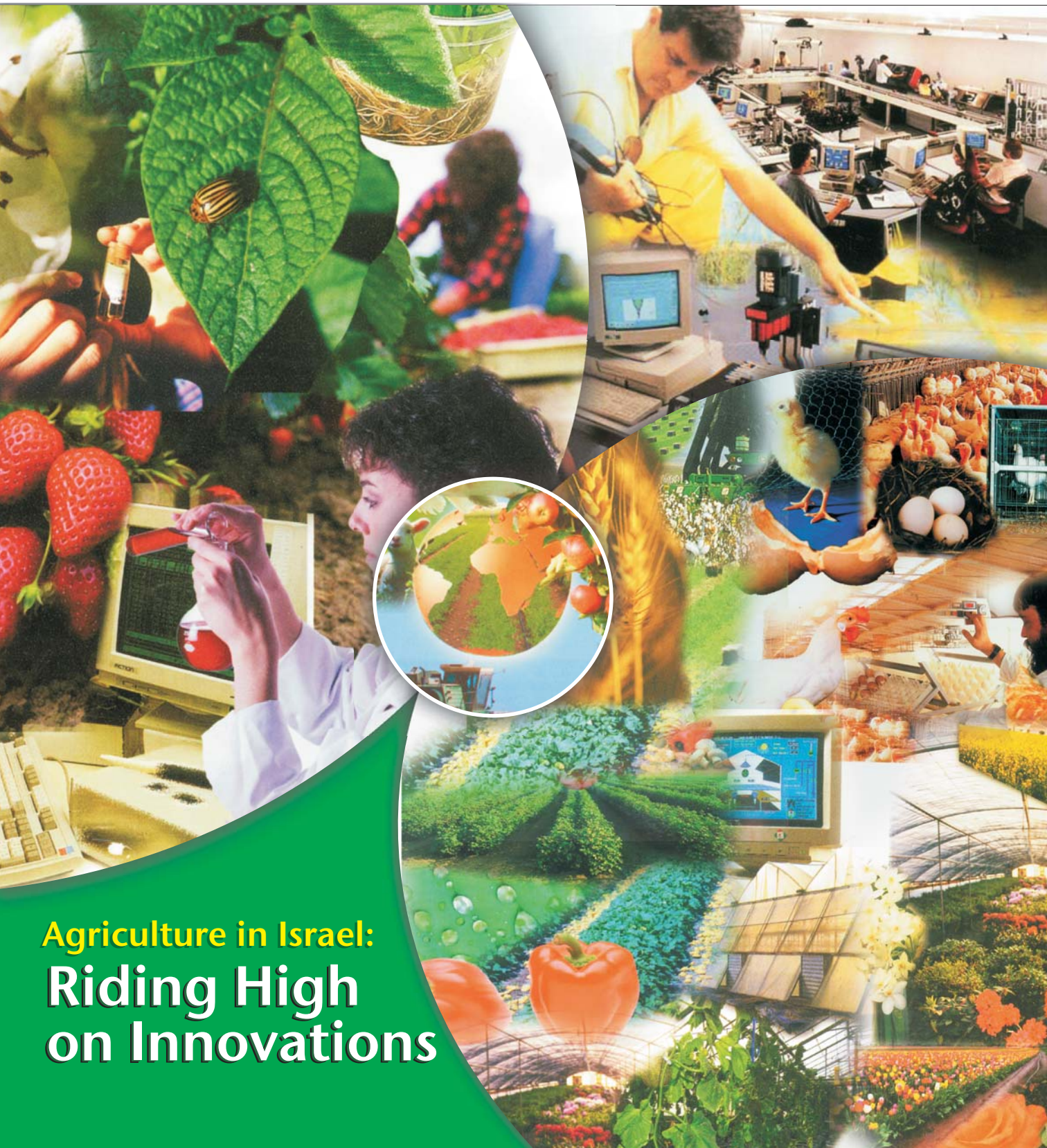

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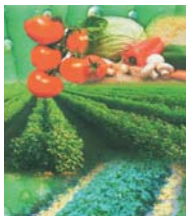

Curtsey: The Israel Export & International Cooperation Institute

Dear Reader,

Greetings and welcome to the Indo-Israeli Business. In this edition, we focus on agriculture in Israel. What this tiny nation situated in a semi-arid zone has done in the field of agriculture has been nothing short of miraculous. As Orna Sagiv, Consul General of Israel in Mumbai, tells us in an interview: although only 2.4 % of the population is involved in agriculture, Israel exports extensively to other regions, so much so that it is called the Green House of Europe. We have detailed write-ups on the various components of agricultural produce in Israel. Floriculture and vegetables and fruits are high-export produce. Israel has also reaped rich harvests in animal farming despite lack of grazing land, and in aquaculture, despite lack of water bodies. We also take a look at bee-keeping, which has done well for itself in Israel. Besides these, we have stories on greenhouse farming and organic farming two kinds of specialized farming that are fast gaining popularity in Israel. There is also an in-depth look at Agricultural Engineering, Research and Development, and Biotechnology, which have been the main contributing factors to the Israeli success story in agriculture. We also have articles on Israel's advanced crop protection programme and its hugely successful Irrigation programme. And, not to mention, there is an overview of the agriculture sector of India.

Wish you happy reading!

Satya Swaroop
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Interview:

"The Land of Milk and Honey"

In spite of being a largely barren land, Israel has made extraordinary strides in the expansion of agricultural production, essentially based on technological breakthroughs. In an interview with Indo-Israeli Business, **Orna Sagiv, Consul General of Israel in Mumbai,** spoke at length about the state of Israeli agriculture and the potential avenues of collaboration between India and Israel in this sector.

More than sixty per cent of Israel is subject to semi-arid and arid conditions and may be classified as desert. And yet, it has done outstandingly well in agriculture. How has it managed that?

In the past 63 years, Israel's population increased 12 folds; from 6 lakh in 1948 to 7.5 million today. Adversities of nature such as scarcity of water and shortage of arable land multiplied the severity of the problem. In this backdrop, painstaking efforts taken by the pioneering generations of Israel, their fighting spirit and innovative approach helped us to overcome these challenges.

Today Israel's agricultural output is more than US $ 7.5 billion which is 2.8% of its GDP. Israel's agricultural productivity and output per hectare is increasing consistently in spite of fall in number of farmers and land under cultivation in the last decade. Israel's agriculture exports have increased from $20 million in 1950 to $1.2 billion in 2009, and farmers are only 2.4 % of its population today. Israeli agriculture is mostly export-oriented and its import consists mostly of food grains, spices, sugar, tea, etc. Israel is popularly known as the Green House of Europe, particularly in winter. It has regained its Biblical identity as "the land of Milk and Honey." It is number one in the world in milk production per cow and offers a wide range of honey.

Recently, Israel's Negev desert has become a hotbed for numerous agro-technologies such as aquaculture, desert agriculture and growing dripless and cherry tomatoes, capsicums and other vegetables.

In the past 63 years Israel has successfully integrated the best practices in agriculture, water management and governance with its cutting edge R&D.

Israel has been at the forefront of developing water and irrigation technologies. How significant has this been in the development of agriculture in the country?

With the exception of the Sea of Galilee, a sweet water lake, and a few rivers not bigger than springs, Israel has no source of potable water. Annual rainfall is mostly less than 50 cm and in the Negev desert it falls below 5 cm. Droughts are regular and the population is growing fast. Israel has to use and

reuse every single drop of water it gets and it is a tough choice to distribute water evenly for urban use, industries and agriculture. This situation sowed the need to develop a world class water industry which could meet the challenges of the present and the future.

Efficient use of available water resources, water treatment and recycling, rainfall enhancement and desalination are important factors of Israel's water policy. Thanks to robust legal framework of water distribution, pollution and heavy investment in education and R&D, water management has become Israel's National Mission.

In agriculture, a conscious decision was made to replace high water-consuming crops such as cotton, sugar and rice with crops that take in saline and lower quantity of water. Drip irrigation and a number of other technologies invented in Israel brought significant efficiency in the agricultural water consumption. Today our agriculture gets mostly recycled water which is pure as potable water. In the past 6 decades agricultural productivity has increased five folds per unit area and per cubic meter of water.

In Israel, water is treated as a national asset owned by the citizens. More than 90% water is part of the national grid. The entire water supply is measured, and payment is calculated according to consumption and water quality. This ensures a just and even distribution and management of water for agriculture.

Israel also places a huge amount of importance in R&D and high technology in agriculture. Can you tell us a little more about that?

In addition to Drip Irrigation technology, Israel has introduced many innovative agricultural solutions such as automated milking, dairy herd management systems, egg-collecting equipment, computerized feeding systems and production-recording computers. Other Israeli innovations include computerized fertigation (a process that automatically injects fertilizer through irrigation systems), gravity-based drip systems for developing countries, and advanced temperature and humidity control methods, which provide healthy environments for poultry, flowers and out-of-season vegetables. Israel is a leading origin of green-houses, net-houses and plasticulture.

Israel is number 1 in the world when it comes to the share of GDP spent on R&D and availability of skilled workforce. A sizable portion of its R&D is utilized for agriculture, but R&D is not restricted to machines. From developing high-yield, high resistance seeds to fertilizers that are soluble in water, collecting farm produce, packaging, storage, processing to marketing – every single aspect of the agriculture chain is benefited from innovation.

Though not an expert, I believe that the future of agriculture will be driven by information technology. Recently Israel has become the first country to use cloud computing technology for agriculture. A cloud application developed by an Israeli start-up along with IBM provides real-time information to farmers in their native language. Empowering farmers with the help of ICT to make the right decisions at the right time would create miracles and could revolutionise agriculture all over the world.

What does Israel's agricultural trade with India consist of? Which are the areas in agriculture where you see scope for greater collaboration between the two countries?

This year we are celebrating the 20th year of full diplomatic relations between Israel and India. In the past two decades, bilateral trade has multiplied 25 times and crossed US $ 5 billion last year. There is progress on Free Trade Agreement talks and the FTA has a potential to triple the bilateral trade in the next 2-3 years. Agricultural cooperation and trade is an important component of bilateral

trade. However, it is difficult to give exact figures as it comes under several heads such as chemicals, plastic and rubber, processed food, machinery and equipments. Most of the Israeli agriculture companies have sizable presence in India. Many Israeli companies have shown keen interest to collaborate with Indian companies in fields such as building dairy farms, green houses, turn key projects, poultry farms, seeds and other aspects of agriculture.

The Government of Israel is closely working with the Indian government to enhance the bilateral agricultural collaboration. Israel's Agriculture Minister, Orit Noked, during her maiden visit to India in May 2011, visited the Agricultural Excellence Center in Haryana established through the joint collaboration between Israel and India. This center has already shown excellent results and more such centers are coming up in Maharashtra in the near future.

In addition to this we have started GroWin, with the support of the Government of Israel, which aims to enhance agricultural cooperation between the private sectors of our two countries. Israel is exploring opportunities to offer educational programmes for Indian agricultural students. Israel's Mashav Institute for International

Cooperation organizes several programmes on agricultural training and it gets good participation from India. AgriTech Israel, a premier agricultural exhibition and conference which takes place once in three years has been getting thumping response from the Indian farmers. So in a nutshell I would say that agriculture has become a very important component of Israel-India bilateral relations.

What, in your opinion, are the agricultural methods and technologies of Israel that could beapplied to Indian agriculture? Conversely, what is it about Indian agriculture that you would like to see replicated in Israel?

Before answering your question, let me state that Israel and India are both ancient civilizations and agriculture is an important part of our national cultures. There are major resemblances and differences in our agriculture. The hardworking nature of our farmers, ability to innovate, enterprising nature of people and integrated approaches are those commonalities. Both Israel and India can learn a lot from close cooperation in agriculture. On the other hand, India is a continental size country with more than 55% people dependent on agriculture. Most of them are marginal farmers and the Israeli model of highly mechanized and technology intensive farming may not work well for the Indian farmers. At the same time, India is blessed with availability of water and arable land. So it will not be wise to copy templates from Israel and paste them in India or vice versa without applying our minds.

I would like to put it in other words. Israel with its small size is like a laboratory and India is like a manufacturing facility. Israel is good in R&D; India has a huge market and is good in low cost high quality manufacturing. Often bilateral cooperation is restricted to Government to Government cooperation. Israel and India share a good rapport and there is immense respect and affection towards each other. So we have huge scope for concrete collaboration between our governments, companies, farmers and the academia. By working closely together, I am sure we will offer solutions not only applicable to India and Israel but also to a number of developing countries in Asia, Africa and South America. ■

Vegetables & Fruits:

Increased Production Leads to High Exports

Vegetables

According to data for 2009, the vegetable growing sector in Israel accounts for about 24% of total agricultural production in the country and about 40% of total horticultural production. The value of the vegetable sector is estimated to be about $1 billion. Production stood at 23 million tons, which are intended for consumption in the domestic market, export of fresh produce to Europe and the USA, and raw material for industrial processing and canning. The increase in production and the uninterrupted supply of vegetable crops were made possible due to the exploitation of a number of factors in the production process, including:

- Production in different regions
- Production in protected conditions (green houses, high tunnels and net houses)
- Exploitation of regional climatic conditions and production in different seasons
- Introduction of new crops and new varieties

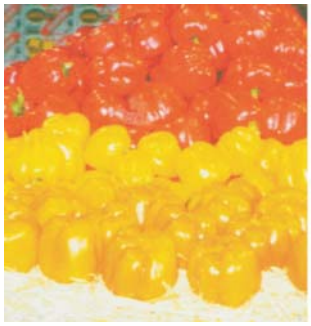
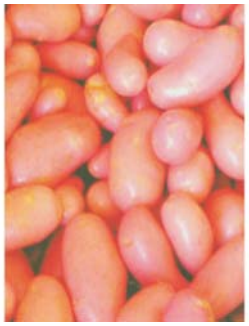
Production in protected conditions has expanded in recent years and now covers about 7,000 hectares, in which a wide variety of vegetables are grown. The main vegetables are table tomatoes, cherry tomatoes, peppers, green herbs, spring- and winter-sown watermelons and melons, leafy vegetables intended for the Orthodox religious market, eggplants and strawberries. The latter two are grown in smaller quantities than the other vegetables mentioned.

Production in greenhouses, walk-in tunnels, and nethouses enables the following:

- Protection of the plants from natural disasters
- Ability to produce in different climatic and regional conditions
- Significant increase in yields and improvement in quality
- Reduction of plant pests which transfer viral diseases and cause direct damage to the plants
- Significant reduction in the use of pesticides

About 70,000 hectares of vegetables are grown in open fields. These vegetables have been adapted to the climatic conditions in Israel and may be grown in various regions, according to the growing seasons and the climatic conditions present there. This group includes potatoes, carrots, onions, garlic, leafy vegetables, sweet potatoes, summer-sown melons, watermelons, and vegetables destined for industrial processing, such as tomatoes, corn, peas, and cucumbers for pickling. Production for export is a main source of income for Israel's vegetable growers, especially in the Arava in the southern part of the country, which is known for its unique climatic conditions in the winter months. These conditions enable production of high-quality vegetables for export, such as peppers, melons, vine ripe tomatoes, and cherry tomatoes. Other regions noted for vegetable production are the Eshkol region, which is considered to be the home of tomato production for the local and export markets, Beit Shean Valley and the Jordan Rift - where fresh herbs for export are grown - and the Sharon and western Negev, which excel in the export of potatoes, sweet potatoes, and strawberries. The Sharon area is also a leading producer of export-quality strawberries. Israel's northern regions specialize in open-field summer vegetable production for industrial processing and canning.

Among the professional


achievements which have had a crucial influence on the formulation of the vegetable branch in the last decade, the following are of particular mention:

• Introduction of new high-yielding and high-quality varieties which are pathogen-resistant

• Improvement and control of climate conditions in protected growing systems

• Introduction of modern irrigation methods based on procedures for control of irrigation and fer tilization in the various vegetable crops

• Application of a growing method on substrate in regions where the soil is unsuitable for growing crops

• Introduction of labor-saving technologies and means, especially in open fields

• Application of Integrated Pest Management (IPM) methods in a range of vegetable crops

• Application of post-harvest methods, means and treatment in order to lengthen shelf life and prevent rotting

Fruits

Fruit orchards cover an area of about 36,000 hectares in 2007, not including citrus groves.

Produce reached 700,000 tons of fruit in 2007 and amounted to a general income value of $840 million. Fruit accounts for 17% of total agricultural production and 15% of total fresh agricultural exports. Israel exported 50,000 tons of avocado, 20,000 tons of persimmon, 15,000 tons of mango, 11,000 tons of dates 5,000 tons of table grapes and 15,000 tons of other fruits.

The varied climate lends itself to a wide variety of fruit crops. In hilly and mountainous areas, for example, deciduous fruit trees, which have chilling requirements, are grown, while in the coastal plain or valleys, tropical and subtropical fruit trees can be grown. In the arid Arava zone, dates are grown successfully. Due to the varied climate and the advanced technologies for growing fruit trees under protected conditions (greenhouses and nethouses) during the cold season, fruit can also be picked out of season, thereby prolonging the marketing period and improving fruit quality.

A number of leading growers have succeeded in reaching peak yields in Israel, for example: apples, 100 tons/ha; bananas, 100 tons/ha; plums, 35 tons/ha; apricots, 35 tons/ha; grapes, 75 tons/ha; peaches, 50 tons/ha; mango, 40 tons/ha; and pears, 30 tons/ha.

Yields of Selected Fruits (2008)

Fruits	Average Yield (tons/ha)
Apples	45
Pears	25
Plums	20
Peaches	35
Apricots	20
Table Grapes	25
Wine Grapes	15
Bananas	45
Avocado	17.5
Mango	30
Dates	15

Source: Fruit Growing Division, Extension Service, Beit dagan

Storage

The use of advanced technologies enables the marketing of high quality fruit which can reach the overseas consumer a few days after picking. Fruit can also be stored

under refrigeration for long periods. Advanced storage technologies are employed in the cooling houses and sorting and packing facilities, as well as in the domestic and export distribution network.

Mechanization

Several mechanical means have been developed in order to increase the efficiency of handling fruit. For example, a hydraulic lift with a booth allows the worker to reach the highest branches. The lift can be steered, guided from tree to tree and raised or lowered to the desired height. In addition to the standard model, a particularly high model has been developed for picking dates.

Research & Development

The growing of fruit in substrate culture has resulted in improved quality, characterized by larger fruit and increased vegetative growth, particularly in heavy and alkaline soils. Mango is the most outstanding example. Better fruit quality has also been achieved by using multi-colored shade nets, which improve the microclimate in the orchard. In recent years, the fruit branch has taken the lead in developing phytomonitoring systems, which enable better quality management, control and supervision, mainly with regard to the irrigation process and efficient water management. One of the main goals of the fruit branch is constant examination of new species and varieties in order to expand the selection of products and extend the marketing season, with an eye on the European consumer. These include pitaya, papaya, passiflora, guava, raspberry, and other "small fruits". This is a local breeding programme for development of new varieties, focusing on table grapes, mango and avocado.

Citrus

Citrus accounts for 5% of Israel's total agricultural produce. In 2008, about 700,000 tons of fruit were produced on a productive area of 19,000 hectares. In recent years, the citrus sector in Israel has been undergoing changes as it introduces new agrotechnologies to facilitate improved operations, including the planting of new citrus varieties.

Citrus Varieties

Israel markets a wide variety of oranges, grapefruits, easy peelers, and lemons, as well as a range of more exotic citrus fruit.

The traditional Shamouti orange is still Israel's major citrus product by volume. Other varieties of oranges exported include the Valencia Late and Navel.

In the past, the white grapefruit, originally grown in inland valleys, was partly replaced by the Sunrise

variety, whose peel and flesh have a red tint. New easy-peeling varieties for export and for the local market, such as Or and Mor, have been planted on a large scale in recent years.

Israel produces exotic citrus varieties, such as lime, kumquat (Chinese orange), limquat (a cross between lime and kumquat), and red or white pomelo.

Citrus Varieties and Yields (2005)

Variety	Yield per Hectare (in tons)
Oranges	42.5
Grapefruit	65.0
Easy peelers	35.0
Lemons	50.0
Exotics	20.0

Environmentally Friendly Fruit

There is a growing awareness of the importance of ecologically-oriented agriculture. This has led to the development of "green" fruit, which is grown with minimal use of chemicals, to avoid interfering with the ecosystem or harming the environment. Production is according to the quality management requirements of the European market, in compliance with EurepGap 2000 principles, ISO standards and crop management protocols. As part of the policy to reduce the use of chemicals, 65% of Israel's citrus groves have instituted Integrated Pest Management (IPM) programs, which use natural control agents such as parasitic wasps and predator insects and minimize the need for chemicals.

Developing New Varieties

Efforts are presently being directed to the development of new citrus varieties that have a lower seed content, longer shelf-life, attractive appearance and long marketing season. The trend is to enlarge the citrus areas of easy peeler varieties that are requested by customers. Model groves, which have been planted in various areas of the country, show promise for commercial success. The outstanding new varieties are Mor, Or, and Rishon. The main varieties introduced from overseas include the Pomelit, Newhall-Navel, Ray-Ruby, Rio- Red Pink Grapefruit, Nova, and Mineola. Rootstocks traditionally used in the past have been replaced by new ones, such as Volka Mariana, Troyer, C-35, and Rangpur, according to the variety, and type of soil and water. In the early 1990s, additional seedlings for grafting were planted, which can withstand conditions of saline or calcareous soils, to which Troyer stocks are sensitive.

New Trends

The citrus sector, which has fluctuated over the years, has concentrated on increasing the efficiency of its operations, introducing new methods and, in addition to the new varieties developed, increasing efforts to meet changing market demands, while bringing citrus farmers greater returns. Citrus marketing has changed considerably in the last decade, from marketing by a monopoly the Citrus Marketing Board of Israel (CMBI) to private marketing entities authorized by the CMBI to compete on the open market. Citrus yields in Israel rose from 20 tons to 50 tons per hectare, with peak yields of 60 - 80 tons per hectare in the Negev desert region.

Irrigation:

Revolutionising Water Management

Lack of water is a major constraint in Israeli agriculture. Less than half of the arable land is irrigable due to the shortage of water. Over 500 km, from north to south, Israel's annual rainfall ranges from 800 mm to 25 mm. The rainy season lasts from October to April, with no rain during the hot summer

Use of Land and Water in Agricultural Production

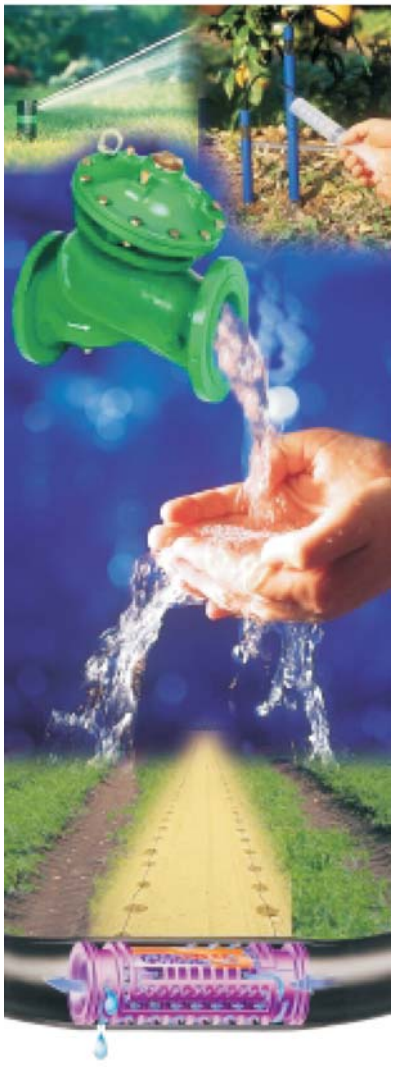
Since the establishment of the State of Israel in 1948, agricultural output has increased twelve-fold, while water use in agriculture has increased only three-fold. The output value in fixed prices has tripled per land unit and increased five-fold per water unit.

Water Resources

Although most of the water resources are in the north and center, agriculture is being developed in the arid south and east. This reality has necessitated construction of an integrated water supply system, which delivers water from the north to the south. The only significant surface freshwater reservoir is the Sea of Galilee, from which an annual average of 400 million m3 is pumped to the south. The total annual water potential is roughly 2 billion m3. Due to over-pumping and frequent droughts, the actual available annual water volume is 1.5 to 1.7 billion m3. The annual water allocation for agriculture is about one billion m3, about one half of which is recycled and brackish water. Water is regarded as a national asset and is protected by law. Users receive their annual allocation from the Water Commission. The entire water supply is measured and payment calculated according to consumption and water quality.

Urban users pay much higher fees for water than farmers, including a water reclamation levy. Farmers pay differential prices for potable water. The first 60% of the allocation costs 20 cents per m3, 60% to 80% costs 25 cents, and 80% to 100% costs 30 cents per m3. This incremental price policy encourages water saving.

Water scarcity and price policy necessitate the use of marginal water, such as brackish and reclaimed water. Brackish water is used for irrigation of salinity-tolerant crops like cotton. In several crops, such as tomatoes and melons, brackish water improves produce quality although lower yields are achieved. The use of reclaimed water for irrigation of edible crops requires a high level of purification. For that purpose, a unique technology Soil Aquifer Treatment (SAT) is now being applied in the densely populated Dan region. After tertiary purification, the water percolates through sand layers, which serve as a biological filter, into the aquifer. From there it is pumped at nearly potable quality and can be used for unrestricted irrigation.



Irrigation Technology

Since the early 1950s, intensive efforts have been invested in irrigation research. It was clearly shown that water use is much more efficient in pressurized irrigation than in surface irrigation. An irrigation equipment industry was established, mainly in kibbutzim, which developed innovative technologies and accessories such as drip irrigation (surface and subsurface), automatic valves and controllers, media and automatic filtration, low-discharge sprayers and mini-sprinklers, compensated drippers, and sprinklers.

Fertigation is routine in most of the irrigated areas. Fertilizer producers have developed highly soluble and liquid fertilizers which are compatible with this technology. Most of the irrigation is controlled by automatic valves and computerized controllers. Due to the division into plots and harsh topographical conditions, only limited areas can be irrigated by mechanized systems, such as pivot irrigation. The innovative irrigation industry has a worldwide reputation, and more than 80% of its production is exported.

Irrigation Regime

Farmers in Israel appreciate the fact that water is a precious and limited resource and should be conserved and handled carefully in the most efficient manner. Modern irrigation equipment enables better control and monitoring of irrigation, which can be translated into higher water-use efficiency. A countrywide network of agro-meteorological stations delivers real-time weather data to farmers. The data are used to adjust the irrigation regime. Diverse soil-moisture monitoring devices, including tensiometers, pressure chamber systems, and electrical resistance sensors, are utilized for more precise specific local adjustment. Vegetal indicators, such as leaf water potential and fruit growth rate, are used to achieve further precision in water application. The average annual water application per hectare has decreased from 8,000 m3 to 5,000 m3 over the past fifty years, while agriculture has spread to the more arid regions in the south and east.

Recycling of Drainage Water

In Israel, typical leaching fractions used in substrates for removing salts are between 30 and 50%. As a result, one third to one-half of the applied water drains out, carrying 130 mg/l nitrogen, 20 mg/l phosphorus, and 140 mg/l potassium as well as the natural salts. Approximately 1,000 kg of nitrogen, 1,600 kg of chloride and 800 kg of sodium are leached from one hectare of substrates, which are a potential polluting factor of more than 100 million m3 of groundwater.In the last few years, around 25% of greenhouses with soilless substrates shifted from open to closed irrigation systems. This shift is even more impressive in rose production, where drainage water is recycled in over 50% of the greenhouses. Recycling of nutrients by reusing water drainage in soilless cultivation appears to be the most logical solution: Approximately 50% of water and fertilizer inputs are saved, because of reduced tap-water supply and improved nutrient availability to the plants. The potential pollution of the aquifer from the open irrigation system is reduced. The transition from an opened to closed irrigation system unexpectedly resulted in yield increase and higher fruit/flower quality, due to the higher fertigation control and monitoring applied in the new technology.

Future Trends

The expanding urban population, as well as potential political developments, will likely further reduce the fresh water supply for agriculture. The solution lies in the desalination of brackish water and high-level water reclamation. A more significant part of annual crops will be grown under cover, where recycling will become routine. The concepts of ultra-low irrigation rate and vegetable monitoring have to be further examined for their contribution to higher efficiency of water utilization. ■

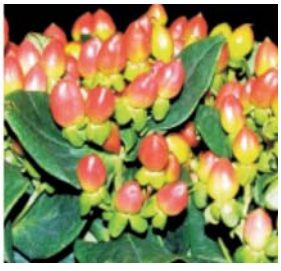
Floriculture:

Contributing 30% of Fresh Agri Exports

In 2004, flowers and ornamental plants account for 8.0% of Israel's total agricultural production, and 28.3% of the country's total fresh agricultural export. Israel producers 1.2 billion flowers on an area of 2,750 hectares, 80% of which are destined for export throughout the year, mainly to Europe. Israel's flower sector is relatively small by international standards, but it is profitable. The average flower farm is about 2 hectares. The farmers' expertise, combined with support from and collaboration with research institutions and extension services, contribute to the high quality and wide variety of more than a hundred kinds of flowers. Although the number of flower growers is constantly decreasing, production has remained stable due to technological advances and an intensive production system.

Varieties of Cut Flowers and Acclimatization of New Varieties

Dozens of flower varieties are grown in Israel, including roses, ornamental plants, Gypsophila, wax flowers, Solidago, Limonium, lisianthus (Eustoma), gerbera, Hypericum, and Anemone. In the past, traditional varieties (such as rose, gerbera and carnation) accounted for about 80% of total flower production. Today, these varieties account for less than 35% of total flower production. The rapid research and development period for new cut-flower varieties, until they become commercial, is due to the joint efforts of floriculture extension workers, the Flower Department in Plants Production and Marketing Board and other technologies. The Flower Growers' Association, researchers, and the growers themselves. New varieties include acclimatized "summer flowers" from Europe, which are picked and exported mainly during Europe's winter season; various acclimatized flowers indigenous to the Southern Hemisphere; development of local varieties and acclimatized native wild flowers that have commercial potential. The new varieties have been developed to suit the changing demands of the world market, from fragrant, colorful and fruit-bearing branches to flowers that are considered environment friendly. Israeli flower growers have also joined MPS, a project sponsored by the Netherlands to promote environment friendly flower production and EurepGAP (European Retailers' Protocol for Good Agricultural Practices) projects to promote flower production with the smallest possible harm to man and the environment.



Cultivated Area and Yield Per Hectare (2005)

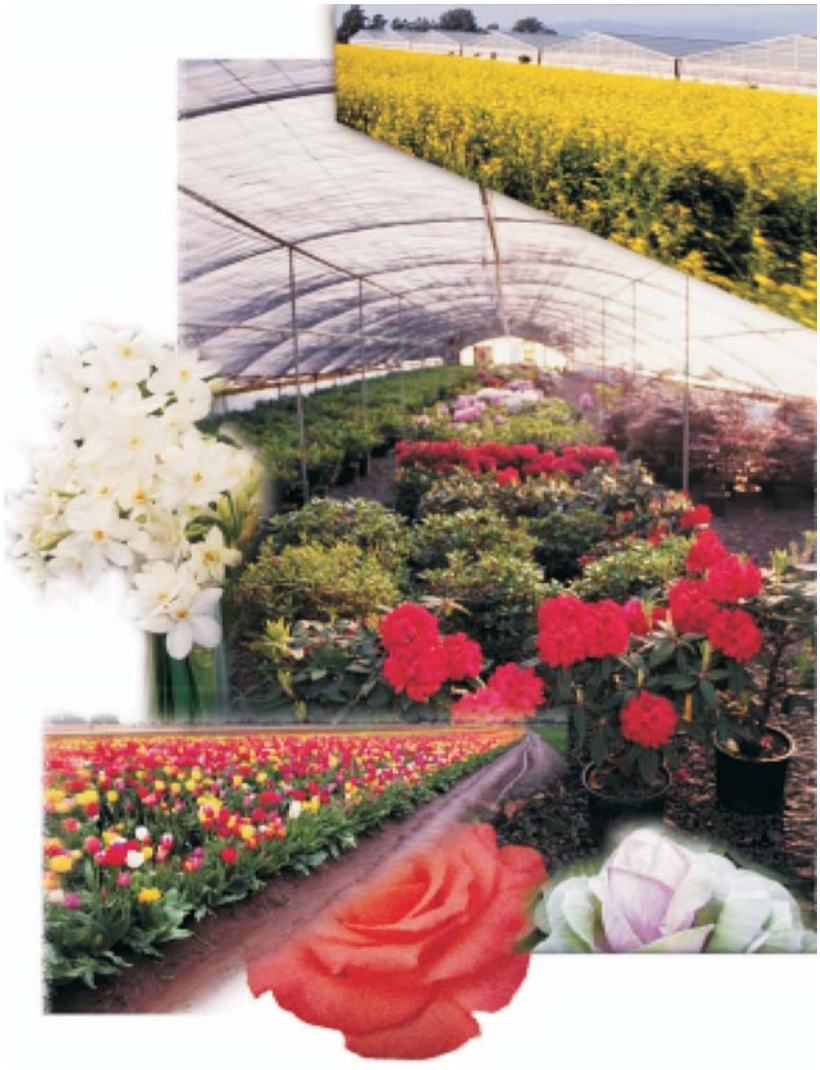
Variety	Area* (ha)	Yield** (per ha)
Wax Flowers	290	400,000
Roses	100	2,500,000
Gypsophila	220	1,000,000
Solidago	140	1,600,000
Safari Sunset	190	400,000
House Plant	120	1,000,000
Ruscus	140	2,000,000
Limonium	60	850,000
Pittosporum	105	750,000
Gerbera	56	1,200,000
Others	1350	
Total	2,771	

Seasonal Production

Originally, emphasis was placed on developing growing methods for winter flower production, through greenhouse and climate-control technologies. Today, some 50% of all flower produce is grown year-round in advanced, computerized greenhouses.

Direct Marketing

The flower sector is based mainly on direct contacts between the local growers and their regular customers abroad. About 60% of output is sold directly from the Israeli grower to flower auctions in Western Europe. Some 20% is sold directly to buyers through the auctions, with



a fixed price, as a long- or short-term deal. The remaining 20% of flower production is sold on wholesale markets in various Western European countries, the USA, and Eastern Europe. Small quantities are exported to Asian countries, mainly Japan. Agrexco a semi-governmental company and Israel's largest exporter of fresh agricultural produce handles flower export together with some private companies.

The chain of post-harvest handling and storage from the moment the flowers are picked until their arrival on the customer's shelf in Europe is strictly maintained in order to guarantee the highest standards of quality and reliability. Traditionally, flowers and ornamentals, which are relatively perishable products, are sent by cargo planes and regularly scheduled flights. Recently, following intensive efforts, sea shipment has become an option. Before a variety is transported by sea, careful research is conducted to learn whether sea shipment is feasible, and the best methods are examined.

Computerized Information

Since 1975, market data have been relayed in real time directly to the grower through computers, ensuring that the picking time meets customer demands. Communication means have changed drastically since then; most communication is now through email and the Internet. Growers rely on data for making decisions on quantities, qualities and destination of their products. Documentation is also available. By entering various details of the crop, the grower receives market information, comparative data on crops and varieties over a number of years and other information. The Agricultural Extension Service has established a website. This site includes economic information on flower production and handling instructions, and guidelines on disease prevention, pest control, fertilization, and processing, as well as information about planned field day, study days and courses.

Plants, Propagation Material and Flower Bulbs

Israel exports a variety of plants and propagation material, including cuttings, seedlings for the home garden, cut flowers, pot plants, tissue culture material, bulbs, corms and seeds. Exports of these products are constantly increasing and today reach over $70 million annually. Recently, export of plant and propagation material has increased significantly, due to increased demand and an intensive effort to meet the high quality required by European and American standards. Israel also produces a wide range of flower bulbs, many of which are unique to the country. The bulbs are used for cut flowers, as well as for garden and pot plants. In addition to propagation material, Israel exports a wide variety of flowering pot plants as a finished product. ■

Greenhouse Farming:

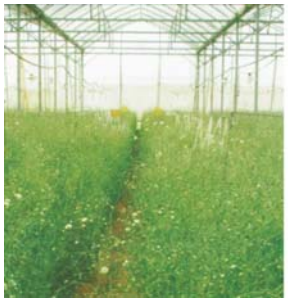
Increasing Yield of High Value Crops

Production under protected conditions has become the principle way for Israeli growers to ensure a constant, year-round supply of high quality products, while minimizing chemical use. This method helps to overcome obstacles imposed by adverse climatic conditions, and a shortage of water and land. The total area covered with greenhouses, nethouses and walk-in tunnels increased from 900 ha in the 1980s to about 11,000 ha in 2008, with 7,100 ha for vegetables and 2,500 ha for floriculture, 1500-2000 hectares for fruit trees cover representing an average annual growth of 5 - 8%. The average farm size is 4 ha for vegetable production and 1.2 ha for flower production

Greenhouses, which are capital intensive both in construction and maintenance, are largely used for high added-value crops such as flowers and vegetables. Due to the high investment, growers are constantly seeking methods to streamline their operations and make them more cost-effective. The greenhouse allows the farmer to control most production parameters including climate, fertigation and biological control of plant disease and insects, optimizing land use and yield distribution during the growing season. Israeli farmers successfully grow between 3.5 and 5.5 million roses per hectare in season. An average of 400 tons of tomatoes are grown per hectare, four times the amount harvested in open fields. In addition, plastic greenhouse structures have recently been introduced for housing livestock, poultry, and fish. In addition to traditional greenhouse crops such as flowers and vegetables, experiments have recently been conducted to investigate the feasibility of growing fruit such as nectarines, peaches, loquats, grapes, pomegranates, citrus, apricots, kiwis, litchis and bananas are now grown in plastic houses as well as in net houses for hail protection, water saving and improved quality.

Plastic Covering

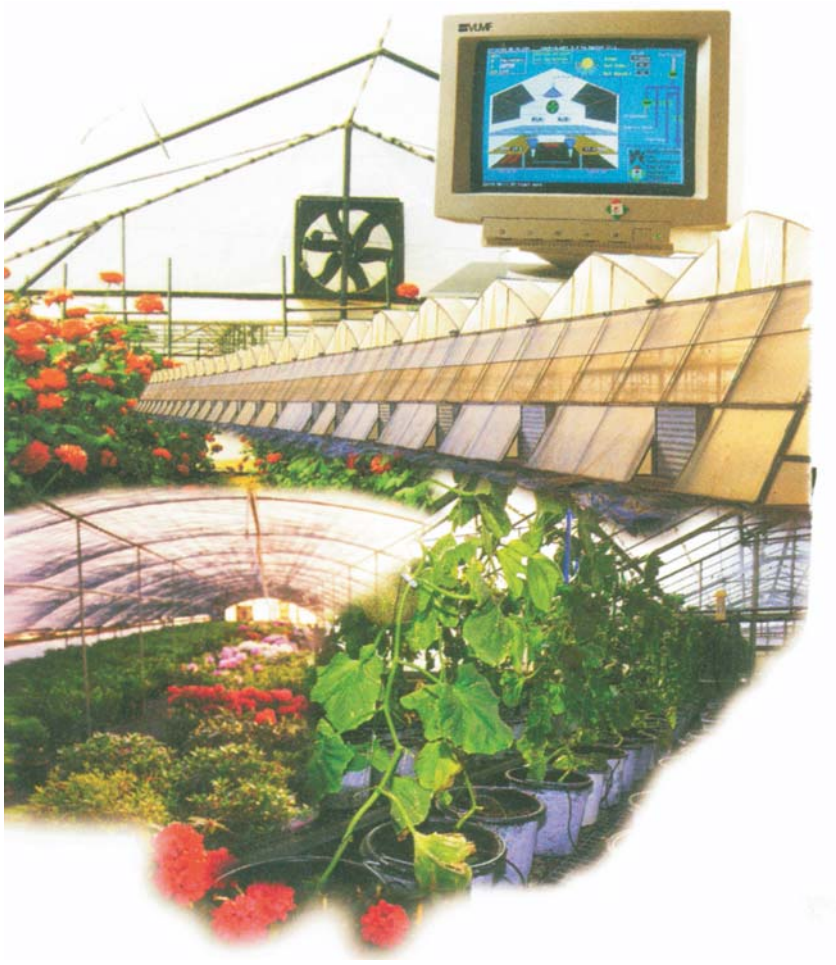
The plastic used for greenhouse covers is mainly polyethylene, with three- or five-layer technology. This provides the cover with special characteristics such as anti-drip, anti-dust and thermicity. The plastic covering produced today is durable and resistant to vapor from sulfur used as pesticides in greenhouses. Israeli-made plastic sheeting is used for covering structures as well as for light-spectrum control and manipulation to influence plant growth and insect behavior; filter ultra-violet (UV) rays; radiate infrared (IR) rays; and refract and distribute light to maximize its beneficial effect on the plants. Some covers include additives that prevent water from dripping onto the plants (anti-fog) and protect the covering against degradation. The addition of various colors also helps combat pests.



Netting

The main Integrated Pest Management (IPM) tool that is used in greenhouses and nethouses is the insect-proof net, mainly 50 mesh. These nets keep the insects out, without using any chemicals. Most vegetable and flower greenhouses are sealed with insect-proof nets. Insects carry viruses that have a devastating effect on plants, and methods of controlling them are expensive. Many greenhouses, in addition to the plastic covering, have net walls that prevent the entry of insects and allow for heat dispersal. Other kinds of netting are used for shading. These nets are categorized according to the percentage of shading they produce.

Advanced manufacturing methods have succeeded in producing netting that serves as a sophisticated thermal screen,



reducing solar radiation during the day, and preventing heat loss at night. The new development is particularly beneficial in areas with extreme day and night temperature differences. This netting is also used to cool poultry houses. New research conducted by Israeli scientists show the advantages of color nets on fruit trees such as apple, nectarine, persimmon, peach and various ornamental cut leaves. The new color net is found to promote earliness, improve quality, produce higher yields and provide other benefits.

Structure

The structure of greenhouses requires a rigid, heavy covering, providing sufficient durability to prevent damage by strong winds and snow. The advanced greenhouse construction currently used in Israel includes curtains, skylights, and shade netting, which move automatically in reaction to sunlight. Modern greenhouses are higher, reaching five meters at the lowest point. This provides better ventilation, while allowing for the installation of shade netting and thermal coverings. It also allows for trellising greenhouse plants such as tomatoes and cucumbers. Israeli standards require that a greenhouse be able to withstand winds of up to 150 km/h. However, greenhouses actually meet far stricter standards and are exported to countries which have harsher climatic conditions than Israel.

Substrates

The total area of greenhouse crops grown in soilless culture (substrates) has increased to 800 hectares. Substrates enable the farmer to better monitor the growing process (for example, soil diseases, nutrition, water content of soil).

The main substrate types are:

Tuff (volcanic ash): This is by far the most commonly used material in Israel.

Organic substrates such as peat moss, coconut coir and composts:

Due to their biological instability, which may lead to aeration problems, these materials are usually mixed with light porous materials such as perlite or Styrofoam.

Perlite: Medium or coarse grade is used for vegetables and cut flowers, while the fine grade is used outdoors.

Rockwool: This media is becoming less important, although it is still used for rose production.

Climate Control

An innovative technology developed in Israel allows cooling of the greenhouses during the day and heating them at night, with a minimal investment of energy. This is accomplished by using a shower/misting/fogging system that sprays uniform droplets and is installed at one end of the greenhouse. During the day, these droplets absorb excess heat from the greenhouse and store it until night, when the heat is released. This method is used especially for ornamental plants, which require a high degree of humidity. This method has been tested successfully for vegetables as well.

The Computerized Greenhouse

Computer hardware and software have been developed in Israel, which allow automatic control of the greenhouse water, fertilizer and

Organic Farming:

A High Growth Sector

Organic farming accounts for about 1.5% of total agricultural production in Israel. It accounts for of fresh exports. In recent years, organic agriculture has become one of the fastest growing sectors, achieving an annual growth rate of 25%. Today, 600 farmers cultivate about 8,500 hectares of organically-grown crops. Organic farming in Israel complies with international principles and standards. The new principles recently approved by the International Federation of Organic Agriculture Movements (IFOAM) General Assembly are the foundation of Israeli organic farming. Organic agriculture has been considered as an alternative approach to conventional farming since the 1940s. However, the turning point was in the late 1970s, when Mario Levi, from Kibbutz Sde Eliyahu, promoted organic farming as a real alternative and showed it to be a profitable and income-generating branch. Organic farming in Israel is conducted under intensive-production systems, and crop yields, quality, and profits often equal and even exceed conventionally-grown crops. Organic agriculture has the additional benefit of being environment-friendly and healthy. Organic farms in all parts of the country use the relative advantages of different production areas to provide a year-round supply of a wide variety of fresh, high quality products.

Standards and Inspection

The Israeli organic standard follows standards instituted by its main target markets, namely EU countries and organic production complies with EU 2091/92 regulations and IFOAM standards. Exporters to the USA are obliged to follow rules and regulations of the National Organic Program (NOP) of the United States Department of Agriculture. The Plant Protection and Inspection Services (PPIS) of Israel's Ministry of Agriculture and Rural Development is responsible for inspection of fresh organic produce.

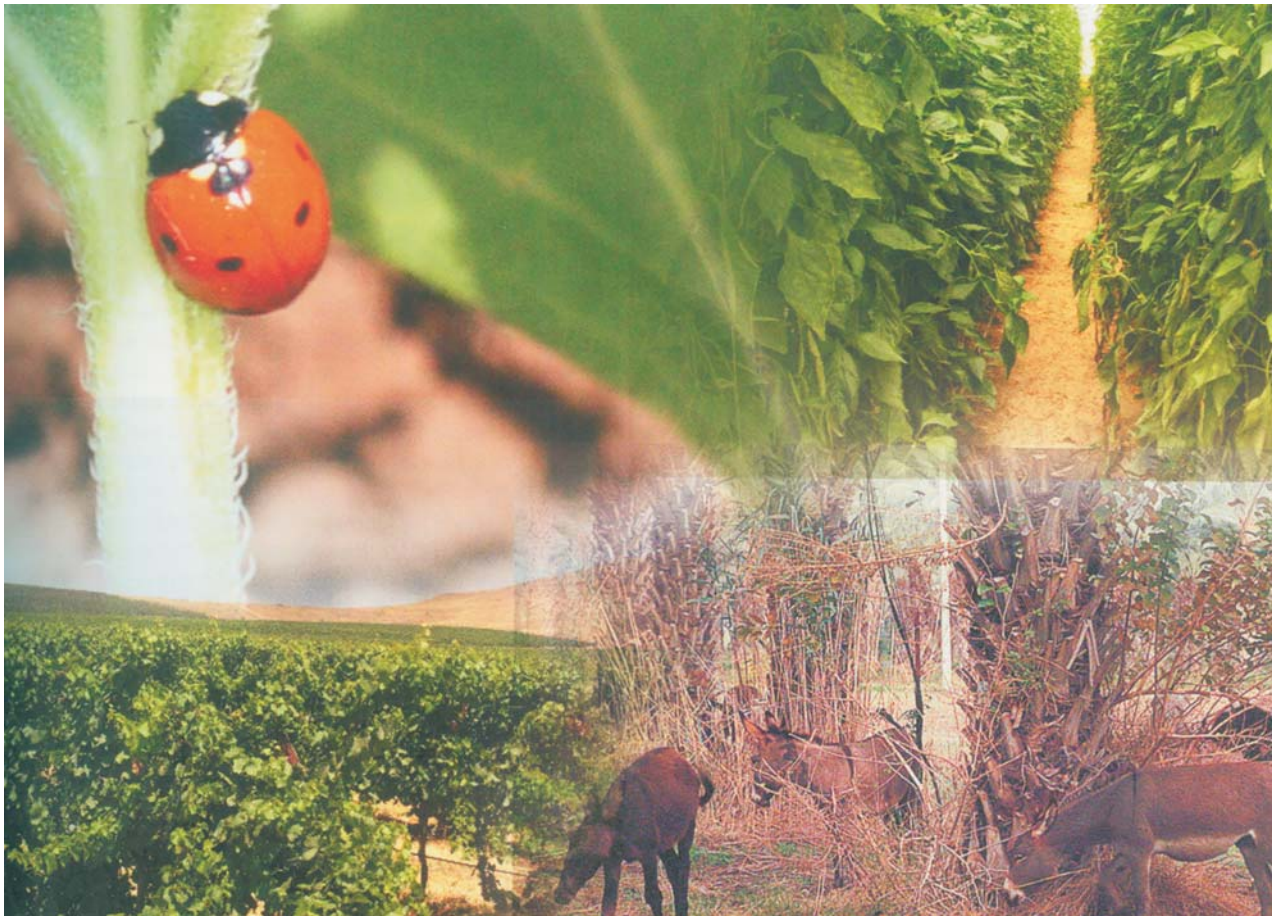
All organic growers in Israel are members of the Israel Bio-Organic Agriculture Association (IBOAA). an IFOAM-affiliated member. They are also part of the Agro Bio Mediterranean (ABM), made up of organic farmers and organisations from Mediterranean countries. The IBOAA promotes, disseminates and develops local organic know-how through courses, field trips, extension activities and marketing. It has set a goal for organic agriculture to reach 10% of total agricultural production within the next years.

All IBOAA's activities are focused on the promotion of the development of a human-, animal- and environment-friendly industry that presents at the same time an economic and employment challenge based on a combination of business entrepreneurship, personal excellence and technological progress.

Crops by Region

The Jordan Valley in the east and the Arava valley in the south is the main supplier of fresh vegetables in the winter. The high level of solar radiation and the relatively hot climate throughout the year are conducive to the growing of sweet peppers, tomatoes, and cucumbers, which are exported mainly to Europe and the USA.

Potatoes and carrots are the main crop in the western Negev desert, where the soils are medium light and the climate is warm. They are exported mainly to the UK and are grown in rotation with carrots, parsnips, onions, celery, paprika, and peanuts, thus maintaining one of the basic requirements for a successful organic farming system. The northern valleys produce field



crops, led by cotton, followed by chickpeas, sweet corn, and organic seed crops. Cotton is an outstanding example of an organically-grown crop, which until a few years ago was unheard of or even unthinkable, since pesticides were the standard procedure used in conventionally grown cotton. The introduction of organic agriculture practices has had little, if any, negative effect on the crop's natural life cycle. There are organic orchards in various parts of the country. The main crops are dates in the Arava and Jordan valleys, and avocados and citrus in other regions. These crops are mostly targeted for export. The fruits grown organically for the local market include olives, mangos, apples, stone fruits, figs, and wine and table grapes.

Processed Organic Products and Inputs

In recent years, processing of organic products, has developed alongside cultivation in the field. Today, a wide range of products are canned, frozen, or extracted for oil. The agro-industry sector produces inputs to support and provide organic farming. These inputs include compost, plant nutrition additives, pesticides, and irrigation equipment. ■

Animal Farming:

A Success Story Despite Lack of Grazing Land

Cattle

In 2008, dairy and beef herds accounted for about 15% of Israel's total agricultural production: 11% in milk and dairy products and 4% in beef products. The dairy sector supplies the country's total dairy requirements, with production potential greatly exceeding domestic needs. Production is regulated by a planning and quota policy, which is currently undergoing structural changes, with emphasis on environmental aspects. Israel's dairy industry faces the challenge of meeting the demand for milk and milk products in a country whose population increased ten-fold since its establishment in 1948. Milk consumption per capita reaches 200 liters per year and places Israel among the world's leaders in the dairy industry. According to data collected by the Israel Dairy Board (Production and Marketing), milk consumption in Israel increased from 92 million liters in 1950 to 1,280 million liters in 2008. Average milk production per cow has increased two and half times since the 1950s, from 3,900 kg annually to more than 11,461 kg in 2008. Fat and protein percentage increased dramatically during these years, reaching the highest level ever in Israel (3.62% of fat and 3.20% of protein) in 2008. The annual amount of fat and protein production per cow in Israel is the highest in the world (over 780 kgs).

Israel's dairy-product and -technology exports include advanced and computerized milking and feeding systems, cow-cooling systems (to reduce heat stress on cows in Israel's hot and dry summer), as well as milk processing equipment (especially "minidairies"), consultancy, and joint international project development. Israeli-Holstein genetic sources have the potential for better adaptation and performance under hot climatic conditions, a fact that makes importation of heifers and frozen semen from Israel very attractive to countries with harsh climatic conditions. The achievements of Israel's dairy sector have been made possible through the development of an efficient system with an integrative approach, and a combination of factors, including:

Israeli Herdbook

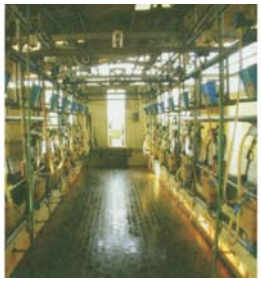
The Israeli Herdbook, managed by the Israel Cattle Breeders' Association (ICBA), is a computerized databank allowing users to trace milk yield, content and quality, as well as the genealogy, fertility, and health data of every cow in the country.

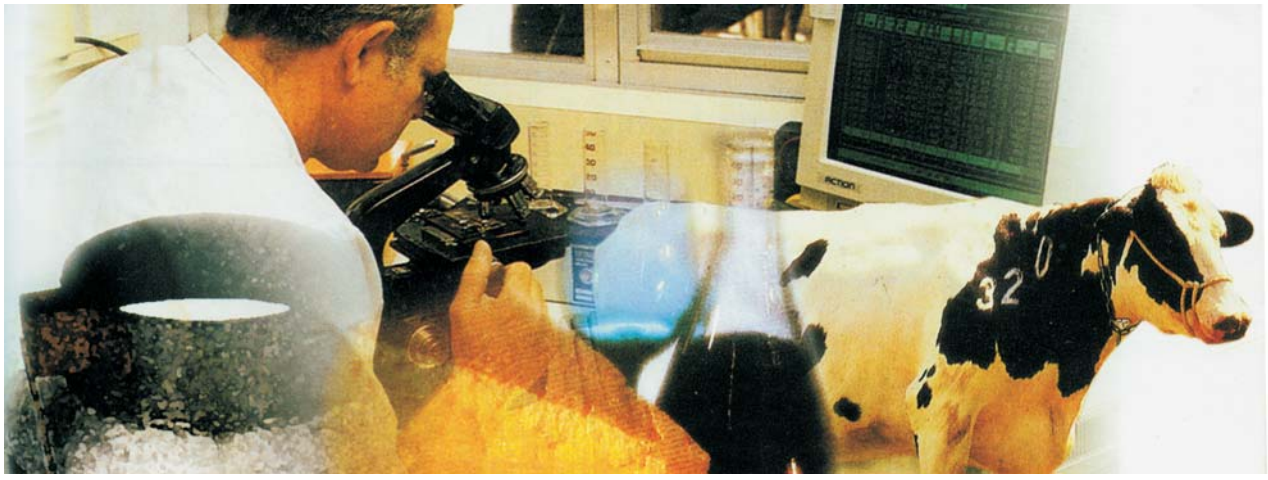
Breeding

On the whole, Israel's dairy herd is genetically made up of Israeli Holstein cows, which are characterized by their adaptability to harsh and varied climatic conditions. Most Israeli herds are included in the Herdbook progeny test and the majority of the cows are inseminated with semen collected and processed from Israeli sires. Israel has the potential to export high quality semen, mainly to regions with harsh climatic conditions.

Feeding

Israel has almost no grazing land and therefore most of the herd's nutrition is based on a Total Mixed Ration (TMR). The feed is generally prepared in central regional feeding centers, serving herds in the area. The diet of Israeli cows contains a relatively high proportion of agricultural residues and by-products, a fact that lowers feeding costs while reducing environmental contamination. In order to facilitate feed processing and reduce overloading, special machinery such as mobile wagons and self-propelled wagons has been developed.





Technologies

Israel's dairy industry employs locally developed advanced technologies that have changed the industry through automation, bringing it under strict control. This eases the workload and ensures operations that meet prescribed standards and reach high profitability. For example, a flow-meter is attached to the milking equipment, automatically measuring the milk flow and milking duration. It is also used as a means for early detection of mastitis, and udder infection. A tag containing an "activity-meter" used to identify the cow and transmit information to the computer regarding the cow's general activity, detecting sick cows as well as those in estrus. Feed systems software developed in Israel calculates the amount of food required for optimal nutrition and economic efficiency. The feed monitor is a mobile unit that stores data on the feeding process. After the feed is distributed, the data is transmitted to the central computer and is used for feeding analysis. Cooling systems, developed in Israel and based on Israeli-made equipment, are used in most dairy herds and help maintain relatively high production and fertility levels in summer and reduce production seasonality.

Milk Processing

After milking, the milk undergoes a laboratory and quality test. It then continues through the pasteurization process, after which it can be manufactured into butter, yogurt, cheese or other dairy products through totally automated systems. Israel offers its consumers a wide range of over 1,000 dairy products.

Beef

Israel's dairy herds supply approximately 40% of the country's fresh red-meat requirements. The rest of the local market demand is met by beef-breed herds located in grazing areas, imported young bulls for local fattening.

Structure of Dairy Farming Production

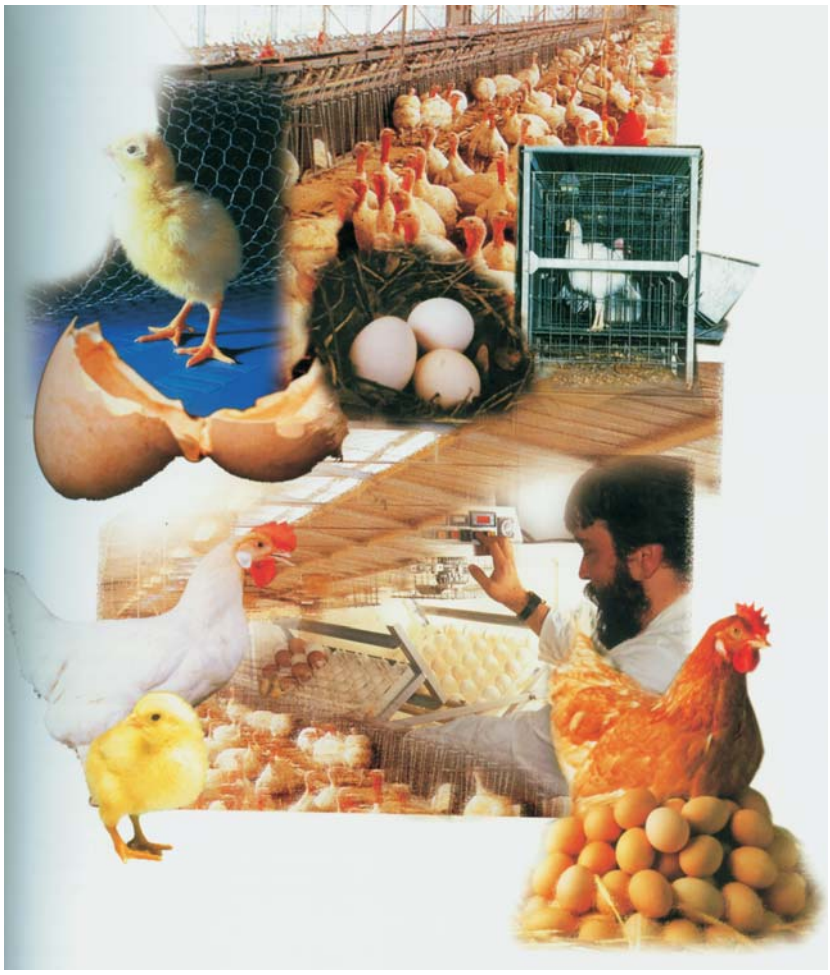
Dairy farms are located on kibbutzim (60% of national production) and moshavim (40% of national production). An average moshav dairy herd consists of about 75 milking cows, while the average kibbutz dairy herd is about 389 cows.

Planning

Dairy farming is subject to production quotas. These quotas are set by the Dairy Board and prices are controlled by the government. According to special governmental regulations, no dairy farm may produce or market unprocessed milk. This procedure helps to maintain the balance between supply and demand in the sector, while allowing continued growth and reasonable profitability.
Source: Israeli Herdbook

Poultry

Israel's poultry sector accounts for almost one-fifth of the country's total agricultural output. Per capita consumption of broiler and turkey meat and eggs is among the highest in the world. In addition, ostriches are raised for leather and meat, primarily for export.



About 1.75 billion table eggs 430,000 tons of broiler eat and 100,000 tons of turkey meat are produced each year. Hot climate conditions in Israel necessitated the development of highly productive, disease-resistant poultry breeds.

Characterised by excellent feed conversion rates, a rapid growth rate, high egg production (an average of 250 eggs per layer) and low-fat meat, local strains of chicken are widely exported, particularly to countries with exceptionally hot climates.

The raising and breeding of broiler chickens is the most prominent sector of Israel's poultry industry, accounting for more than 60 percent of poultry output. Breeder and broiler farms, as well as meat processing plants, are fully automated, rendering annual meat yields of 210 kg per square meter of broiler house. egg production includes, inter alia, organic and omega-3 enriched products as well as eggs from free-range chickens.

Israel is the world's largest per capita consumer of turkey meat. A wide array of processed turkey products are also exported, mainly to Western Europe. Extensive automation, strict hygienic conditions and development of disease-resistant breeds contribute significantly to high meat production.

Technology plays a key role in Israel's poultry industry. Equipment has been developed in Israel to improve production and efficiency. One example is an automatic egg collector that cuts man hours in half when compared with manual collection.

Other innovations include a unique drinking system and durable plastic slat flooring to enhance hygienic conditions and improve flock health. Sophisticated control systems have been developed to maintain optimal levels of humidity, heat, lighting, feed and ventilation in the henhouse around the clock. Wall and ceiling insulation effectively blocks 95% of the radiation emanating from the sun. Special lighting systems save up to 80% in electricity costs.

An automated weighing system provides early detection of disease and monitors optimal weight, while computerised feed dispensers monitor control food quantities R&D has also led to the development of a monochromatic red light that stimulations laying productivity.

Other areas of research deal with in-embryo chicken development. Israeli researchers have found that early feeding in the embryo stage improves broiler growth. They have also found that manipulation of the temperature to which the embryo is exposed in the hatchery can reduce the impact of heat stress on the broiler.

Sheep and Goats

Sheep and goat production for milk and meat is one of Israel's oldest agricultural branches. Today, approximately 2,400 families raise sheep and goats under a wide range of production systems: from extensive, traditional, semi-nomadic, and transhumant flocks to the intensive, zero-grazing dairy and meat units of the moshavim, kibbutzim, villages, and farms in various parts of the country. The evolution of the Israeli sheep sector is a good example of how modern

technology has been integrated into a traditional farming system through research and extension.

Improved Awassi Sheep

The improved Awassi, known for its remarkable high milk production has been developed from the local Awassi. The high milk production has been achieved through an ongoing selection process over a period of sixty years. The improved Awassi is larger than the local Awassi. Under intensive conditions, the improved Awassi produce an average of 550 liters of milk per lactation. Improved Awassi sheep from the Kibbutz Ein Harod flock have been exported to several countries in Asia, Africa and Europe.

Saanen Goats

Saanen goats known for their high milk yields, were imported from Europe and found to adapt to the local conditions. Saanen goats are raised under intensive conditions and have excellent milk production with an average annual production of 750 liters per doe. Saasen goats are also known for their ability to reproduce an average of two kids per kidding.

Meat Production

The demand for sheep and goat meat increases during holiday seasons. About 500,000 lambs are slaughtered for meat annually, with a live weight of 23,000 tons and carcass weight of 11,500 tons. Some 86,500 kids are slaughtered for meat, with a live weight of 2,600 tons and carcass weight of 1,270 tons.

Milk Production

Some 20 million kg of sheep milk and 19 million kg of goat milk are produced annually. The milk is used for a range of cheese and yogurt products. Due to their high quality and hygienic properties, sheep- and goat-cheeses are exported, mainly to the USA. ■

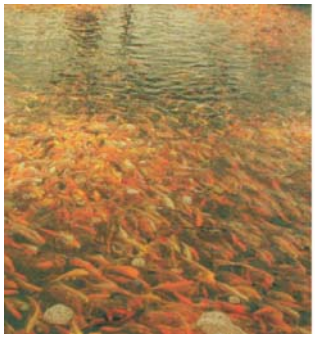
Aquaculture:

Raising Fish in an Arid Land

Israel's semi-arid climate, characterized by a shortage of water, necessitated the development of an intensive form of aquaculture. Saline seawater is used extensively and advanced technologies are employed to make maximum use of every cubic meter of water. Aquaculture accounts for 2.9% of total agricultural production. The sector requires approximately 100 million m^3 of water annually. Over 85% of the water is non-potable, and its sources are winter runoff and saline wells. Fish farming is carried out in the open sea and in ponds. Sea fish, including bass and seabream, are raised in floating cages. Freshwater or inland fish, including tilapia, mullet, carp, trout, bass and silver carp are bred in artificial ponds and reservoirs. As in many other countries, fish consumption in Israel has risen in recent years. Today, average consumption stands at 11.4 kg per capita, which is expected to reach an estimated 12.6 kg by 2020.

Fish Farming in Ponds and Reservoirs

One of the main methods currently used in intensive farming is the closed water system. The unique feature of this system is the constant flow of water from the reservoir, through the covered breeding ponds, and back to the reservoir. In this case the reservoir also serves as a bio-filter, reducing the concentration of nitrogen in the water, which is directly absorbed by the algae and bacteriologically broken down. Due to the high density of fish in the breeding ponds, farmers enrich the water with oxygen and feed the fish protein-rich food. The result is a 40-fold increase in production, from 0.5 kg per cubic meter in an open pond to 20 kg and more per cubic meter in a covered pond. Other closed water systems based on biofiltration units are also being developed. These are expected to produce over 100 kgs per cubic meter of water. The result is that more fish will be produced with less water. Another method is the utilization of water in reservoirs intended for irrigation. The use of reservoir water for two branches of agriculture also contributes to water savings.



Desert Aquaculture

Fish farming in the desert provides a long-term solution to the problem of increasing fish production in a small country with limited water resources. This is feasible due to the desert aquifers or underground water sources. Development of technologies suited to the unique conditions of arid zones enables intensive aquaculture there.

Marine Fish Farming

Due to the lack of fresh water, fish farmers have begun to exploit the sea. One method involves offshore cages along the coasts of the Mediterranean and the Red Sea. Another method is breeding ponds located near the sea, which utilize seawater in a closed water system, whereby water is circulated from the ponds to the sea and back again. Mariculture is developing rapidly, mainly in the Red Sea region. Production rose from 900 tons in 1997 to 3,000 tons today. Constant efforts are being invested in the development of offshore marine aquaculture. Various solutions, engineered for rough open-sea conditions, have been developed and presented to potential investors. In coastal mariculture, an innovative water

pumping system, especially tailored for shallow sandy coasts, has been developed and successfully tried in pilot plant conditions.

Ornamental Fish

A wide range of ornamental fish and marine plants are bred, including coldwater fish, tropical fish and water lilies. The products are exported overseas, especially to Europe. Annual turnover reaches some $8 million. Israel's hot summers are conducive to the rapid growth of ornamental fish, noted for their beautiful colors.

Research & Development

The demand for a wider variety of fish has resulted in the introduction and careful Acclimatization of several new types, such as bass imported from the USA and freshwater crabs imported from Australia. Fish farmers have recently begun to farm the highly valued sturgeon for export. Other saltwater fish, such as the sea-bream, have been acclimatized, and work is currently in progress on the acclimatization of the grouper fish for commercial production.

Main Fish Species (edible fish) Cultivated in Israel (2007)

Fresh and Brackish Water	Tons
Carp	6,737
Tilapia (St. Peter's fish)	7,973
Mugilids	1,983
Chinese Carp	1,135
Trout	431
Bass	147
Barramundi	100
Sea bream	17
Other	645
Total Fresh /Brackish	**19,168**
Maricuture	
Sea bream	2,187
Labrax	26
Red drum	36
Other	2
Total Mariculture	**2,251**
Total	**21,419**

Source: Dept. Of Fisheries and Aquaculture, Ministry of Agriculture and Rural Development

Beekeeping:

Taking Apiary Management to a New Level

Israel is known as the land of Milk and Honey. The diverse geographical zones in Israel enable beekeepers to produce many types of honey originating from typical sources of nectar. There are about 500 beekeepers in Israel, with over 10,000 of Langstroth beehives. Nearly 75% of these hives are in large commercial apiaries, with hundreds and even thousands of colonies. This factor in distinct contrast to most developed countries where largescale commercial beekeeping is only a small fraction of the overall bee industry has undoubtedly contributed to high standards of modern beekeeping and apiary management in Israel. There is a natural lack of bee pasture in Israel, due to the water shortage that has reduced the availability of nectar-rich crops. This has been further aggravated by rapid urbanization and the uprooting of orange groves and roadside eucalyptus trees, both of which used to be primary nectar sources for honey production. Consequently, beekeepers in Israel have adopted advanced, efficient beekeeping methods, including mechanization and breeding in order to increase their honey yield, resulting in an average annual honey production of 40 kg per hive.

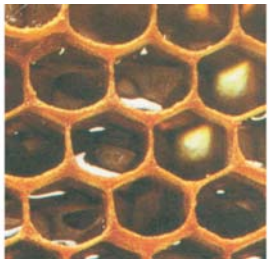
The major importance of beekeeping in agriculture is not, however, the production of honey, but rather the many crops that can be pollinated exclusively or primarily by the honeybee.

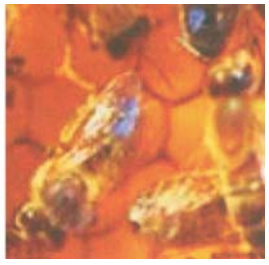
Distribution of Bee Farms According to Size

The modern Israeli bee was originally bred from selected local stock (Apis mellifera syriaca), which is a relatively aggressive bee and was difficult to work with in modern apiaries. Over the years, this bee has been crossbred with other imported strains, in an attempt to moderate its temperament, and today the most common bee in Israel is the Italian bee, which was imported from the USA. The Italian bee is generally non-aggressive and is considered a good honey producer.

Honey Production

Israel produces about 3,200 tons of honey annually, with the yield per hive varying from 20-30 kg for small-scale beekeepers to 50-60 kg for large commercial apiaries. Almost 40% of Israeli honey is produced from citrus blossoms, and is of the highest quality. The remaining 60% is usually produced from a wide variety of wild flowers, herbs, thistles, eucalyptus trees, orchards, and legumes. Local annual honey consumption is 3,600 tons, and the annual turnover of this sector is about $10 million.





Pollination

One of the most important aspects of beekeeping is the use of bees as indispensable pollinators for many agricultural crops, such as avocado, melons, cucumbers, sunflowers, strawberries, winter vegetables, and many seed crops. Many crops depend exclusively on the honeybee for their pollination, and others obtain up to 30% increased yields by using bees. Bees are used as efficient pollinators in orchards, fields, and greenhouses. Over 60,000 hives are used for pollination, and the annual turnover of this sector is about $2.4 million. In practice, however, the commercial value of pollination may be estimated at $480 million, in terms of the overall impact of bee pollination on Israeli agricultural produce.

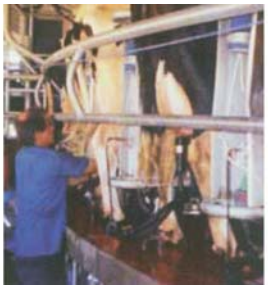
Apiary Products

The beekeeping industry produces, on a smaller scale, several products besides the honey itself and pollination services. These products include beeswax, used mainly for handmade candles and the construction of honeycomb foundations, and royal jelly, pollen, propolis and bee venom, which are used as therapeutic ingredients, mainly in alternative medicine. ■

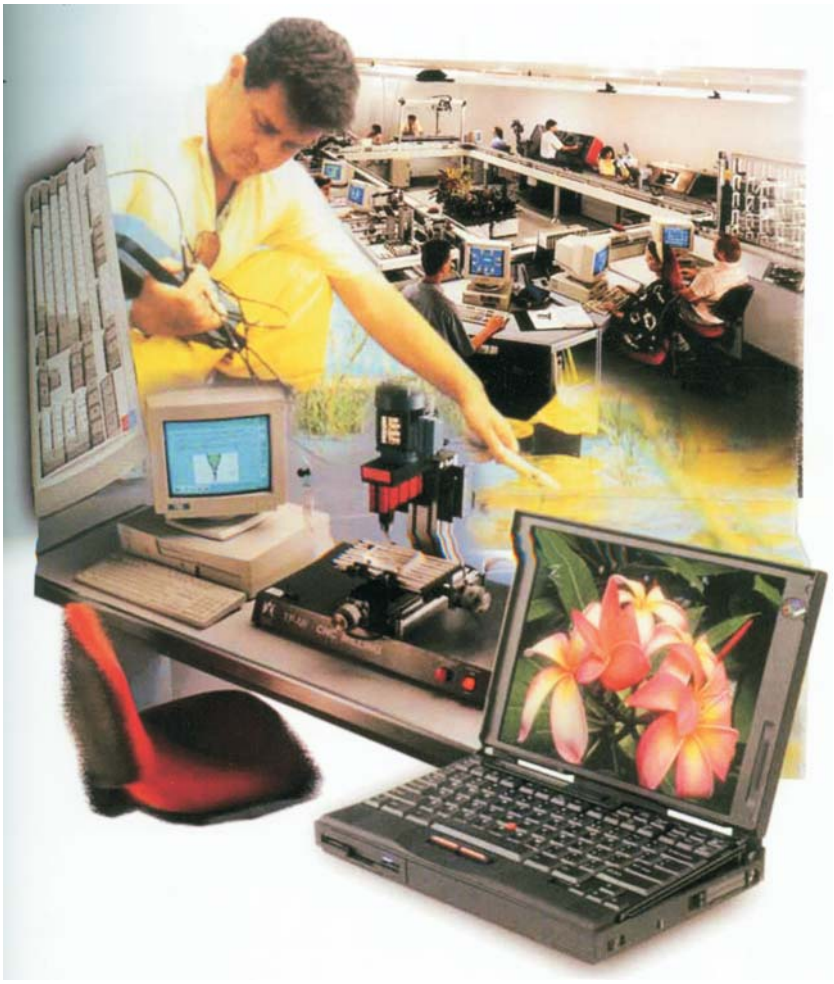
Agricultural Engineering, R&D and Biotechnology:

Putting Israel on the Forefront of Agriculture

Israel's agricultural engineering industry is well-known for its irrigation systems. This industry also produces specially-designed machinery for the specific conditions of Israeli agriculture, including sophisticated sensors, greenhouse equipment, cladding materials, packaging systems, and management software. Agricultural engineering research is mostly application oriented and maintains close relationships with the industry for the benefit of Israeli farmers. Some examples of recent developments are described below: Special sensors have been developed to record plant growth-rate and determine growing needs. The use of these sensors results in significant saving in water and fertilizers, while improving production and quality. Special equipment and machinery for vineyards, which enable management of large vineyards with minimal labor, have been developed and commercialized. These include systems for pruning, windowing, trimming, sweeping, and spraying. Harvesting systems for crops such as flower bulbs, potatoes and sweet potatoes, watermelons, dates, jojoba, peanuts, and chili peppers are designed and manufactured according to the special needs of Israeli agriculture. Special systems and methods for post-harvest operations such as separation of clods and stones from potatoes, weighing and sorting flower bulbs and corms according to size, hot-water washing systems for fresh produce, accurate vibrating sizers, flower bunching systems, and length sorting are widely used to improve product quality and reduce labor. A variety of sprayers for dedicated applications are manufactured in Israel, designed for low volume, precise pesticide application. Solar soil disinfestation is widely practiced, using plastic films with special properties. An innovative technology for spray application of polymers for soil mulch purposes was developed, providing a feasible and cost-effective alternative to plastic mulch. The polymers may be applied by spraying the desired quantity to form a membrane film through which seedlings can emerge and later grow on the mulch. The membrane formed is flexible and porous, keeps its integrity on the soil surface, increases soil temperature, and reduces evaporation. In addition, mulched soil prevents the erosion and destruction of young seedlings by sandstorms. The membrane undergoes photo- and bio-degradation, resulting in its complete elimination without environmental pollution and hazards.



A variety of sprayers for specific applications are developed and manufactured in Israel, and designed for low volume, precise pesticide application. New sprayers suitable for work at heights needed in date palm orchard were developed and implemented as well as new sprayers adapted to greenhouse narrow paths. Solar soil disinfestations are widely practiced, using films with special properties. An innovative technology for spray application of polymers for soil mulch purposes has been developed, providing a feasible and cost-effective alternative to plastic mulch. The polymers may be applied by spraying the desired quantity to form a membrane through which seedlings can emerge and later grow on the mulch. The membrane formed is flexible and porous, keeps its integrity on the soil surface, increases soil temperature, and reduces evaporation. In addition, mulched soil prevents the erosion and destruction of young seedlings by sandstorms. The membrane undergoes photo- and bio-degradation, enabling its total



disposal without environmental pollution and hazards. Energy consumption in greenhouse has been reduced significantly by application of variable frequency drive (VFD) units to greenhouse fans and ventilation.

High pressure nozzles systems that create a micron vapor are applied to cool down green houses and extend growing seasons in hot climate conditions, as well to improve the welfare of poultry and dairy cows.

Precision Agriculture (PA) is applied extensively in Israel. PA uses cutting-edge technologies, such as Global Positioning Sensors (GPS), satellites or aerial images, and Geographical Information Systems to assess and understand in-field variation. Development of sensors and technologies for selective application of fertilizers and pesticides take into account health care considerations and environmental and economic factors. PA contributes to precise crop production and optimized inputs, leading to reduced costs and environmental impact. Four types of data are currently available: remotely-sensed images (especially for biomass mapping), yield maps (mainly of grain and tuber crops), elevation maps and bulk soil electrical conductivity (EC) maps. Hyper-spectral and thermal route sensing are being investigated for mapping minerals and water stress in cotton grapes and wheat fields.

Precision livestock farming systems use information technology to improve livestock production efficiency, through greater control of the production process and more targeted application of resources.

The worldwide use of a machine for extracting pomegranate seeds (arils), which is currently the only commercial machine available, enables full utilization of this unique fruit for a variety of products, including fresh seeds in Modified Atmospheric Packaging (MAP),high quality juice and nutritious and pharmaceutical products.

A new system which collects and mows the trimmed branches of palm trees in the orchards was developed. In addition, with a modified bailer, it created a clean efficient solution to this environment issue while the chopped packed material is reused for floor pads in cowsheds.

A mechanical harvester for Proteaceae branches is an efficient replacement for manual and selective harvesting of the branches, meeting the requirement for efficient harvesting when the orchard bears a high percentage of fully mature branches and the market demand is high. Increasing harvesting efficiency is sought by developing agro-techniques to increase uniform plant maturation.

A new peanut digger was developed that creates a windrow of detached plants with their roots and the peanuts in the middle, facing each other and thus protecting the yield from sun burns and dew damages before final harvesting.

A new system which helps ornamental fish growers in the digital fingerling counting apparatus. The use of a digital camera and a unique computer vision system maintain accuracy,

reduce time and manual labor and improve the traceability.

Research & Development

Agriculture today is largely based on research and development (R&D).Modern agriculture faces many challenges, such as market competition, declining water availability and quality, environmental concerns, and availability and cost of human labor. All these require ongoing innovation and close cooperation with the scientific community. The particular challenges facing agriculture in Israel, such as limited availability of arable land and water resources, as well as high labor costs, also act as stimulants for increased research and development. Israel is among the world's leaders in allocation of financial resources to research and development. Approximately, $100 million are invested annually in R&D, representing 3% of the agricultural GNP. As a result of this research effort, Israeli agriculture has become a model for efficient use of water, land and human labor, accompanied by record yields of high-quality products.

National priorities for research are set every year by the Chief Scientist's National Steering Committee for agricultural R&D. For each section/branch, there is an experts' panel that decides on priorities and monitors the achievements of the research activities. Approximately 50-60% of agricultural research is carried out by the Agricultural Research Organization (ARO), Volcani Center, which is the research arm of the Ministry of Agriculture and Rural Development. The ARO consists of six professional research and support institutes: Plant Sciences; Livestock; Soil; Water and Environmental Sciences; Plant Protection; Technology; and Storage of Agricultural Products and Agricultural Engineering.

Research is also conducted at academic institutions, such as the Hebrew University of Jerusalem's Faculty of Agricultural, Food and Environmental Quality Sciences, the Weizmann Institute of Science, the Technion's Department of Agricultural Engineering, Ben-Gurion University in the Negev, and Tel Aviv University. Additional activities in applied research are carried out at regional R&D centers. These were established in order to meet the unique climate, soil conditions, and other needs of each particular region. The regional R&D centers, reflecting government policy for developing the nation's agriculture in peripheral areas of national priority, are located mainly in the north and south of the country, in the Jordan Valley, and in the Negev and Arava deserts.

Most of the research is funded by public sources, and its results are open to the agricultural community. The government and other public sources contribute approximately $50 million annually to the ARO and the Chief Scientist's Fund, whose establishment resulted in a significant increase in agricultural R&D investment. Other international public sources contribute some $12 million annually, including binational research funds with the USA and Canada and the EU. Farmers' organizations on national and regional levels contribute about $6 million annually, collected through a levy on their production.

The private business sector invests an estimated $25 million annually. The investment is directed to products in which investors can assure their ownership of the intellectual property rights. Most of this research is conducted by companies that produce pesticides, fertilizers, seeds, plastics, irrigation equipment, and related products.

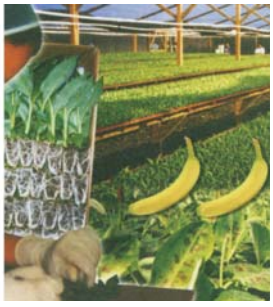
This agricultural input industry is also applying the results of the aforementioned public research. Private-sector investment has increased in recent years, and its share in national research efforts has grown, for the benefit of Israeli agriculture and expansion in export of inputs.

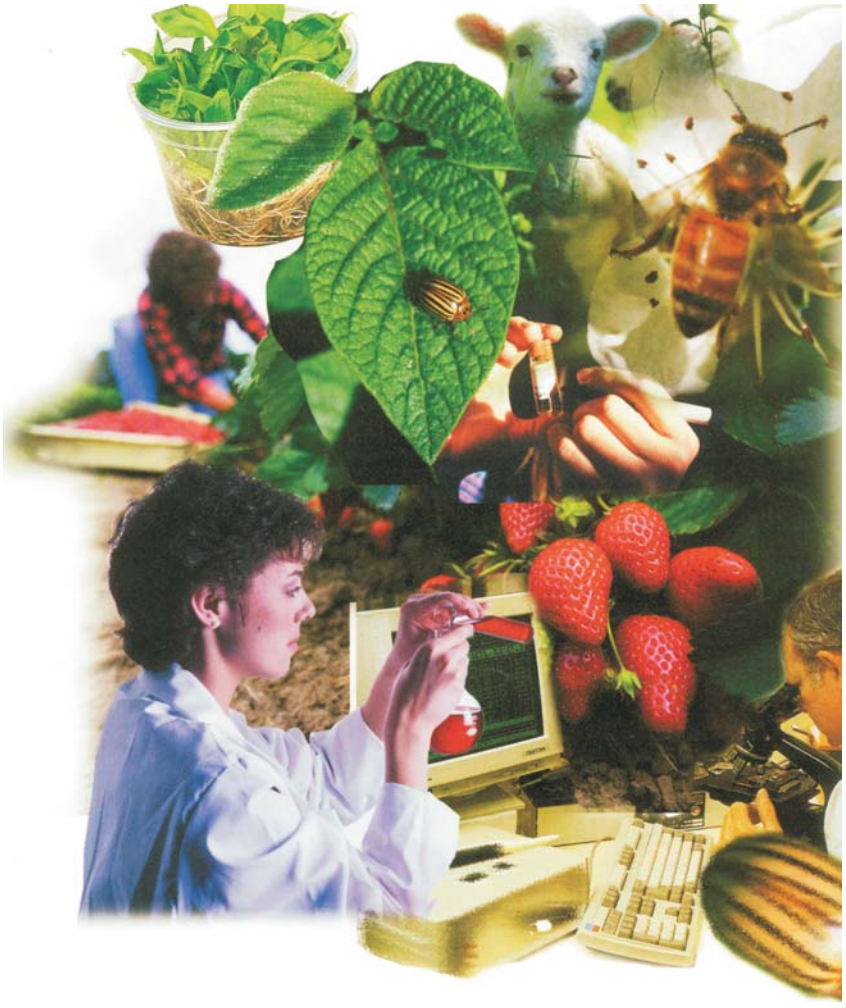
Biotechnology

Biotechnology R&D is aimed at meeting the following challenges of Israel's agriculture:

- Production of high-quality, improved plant and animal germplasm, such as state-of-the-art propagation material and high-tech gene packages for the horticulture and livestock sectors
- Efficient use of bio-pesticides and bio-fertilizers for integrated pest control and environmentally-safe use of chemicals.







• Introduction of new concepts into agriculture, such as the use of plants as bioreactors to produce valuable pharmaceutical or edible vaccines or their use as source for renewable energy.

All these areas of biotechnology deal with food, nutrients and pharmaceutical production and the quality of agricultural products. The common denominator is the attempt to regulate the genes responsible for specific qualitative or quantitative traits. Agricultural biotechnologies are making new inroads, thereby both overcoming the constraints of conventional breeding and cultivation procedures and providing complementary ones.

Emerging biotechnologies, which have undergone a dramatic development over the last twenty years, promise to break through the constraints of conventional methodologies and provide complementary procedures and products.

Below is a description of some current studies in major areas of agricultural biotechnology.

• Plant biotechnology with a focus on major crops

• Microbial agribiotechnology: plant pest control; use of beneficial microorganisms (for biofertilization and improved root growth)

• Environmental biotechnology: use of plants for bioremediation

• Livestock biotechnology: breeding and genetic manipulations (for improved growth, milk and egg production); DNA marker-assisted selection

• Aquatic and marine biotechnology

Some of the major research projects related to these areas of biotechnology are described below.

• Crop improvement-breeding and selection for traits of yield and quality: mapping of disease-resistant genes; molecular analysis of flower pigmentation; improving the quality and shelf-life of tomatoes; as well as vegetables, fruits and flowers generating functional food with antioxidants to provide healthier products by genetic engineering of vegetables; introduction of new horticulture traits to flowers and trees; generating plants expressing drought and salinity-responsive genes to render them more resistant to extreme environmental stresses

• Plant pest control: control of phytopathogenic fungi, bacteria, viruses, nematodes, and insects

• Cell and tissue culture: rapid clonal propagation; germplasm conservation; scalingup of micropropagation of ornamental plants, using optimized bioreactors; acclimatization of micropropagated plants; clonal propagation of forest trees

• Use of beneficial microorganisms for improving plant growth and biofertilization

• Recycling of agricultural and other wastes: lignin degradation; biodegradation of xenobiotics, pesticides, and herbicides; biofiltration and absorption of toxic chemicals and industrial wastes

• Improving the oil content and soil composition of non-edible plants which can be used for biodiesel

• Development of seedless cultivars; production of hybrid seeds and flowering control in tomato, pepper, melon, cucumbers, and strawberries as well as detection of pestresistant genes and markers; use of transgenic breeding to render plants resistant to viruses such as TYLCV, CMV, ZYMV and the like

• Characterization of new genes and their regulators to combat biotic and abiotic stresses in plants along with study of molecular markers for breeding of vegetable crops, field crops, fruit trees, and ornamentals

• Biological control of post-harvest diseases of fruit and vegetables; regulation of natural pest-resistance of the avocado fruit; molecular-physiological studies of fruit ripening and softening

• Development of bio-diesel as a renewable fuel for diesel engines, through chemical conversion of oil-producing crops

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Post-Harvest Technologies

There is a growing requirement in agricultural markets for high quality produce, which is free of pests, pathogens and pesticides. The main objective of the Institute for Technology and Storage of Agricultural Products in the Agricultural Research Organization (ARO) is to solve current and anticipated problems of post-harvest agriculture in Israel, in order to enable the marketing of such high quality produce.

Many post-harvest developments are the result of requests by the local food industry and related bodies. Others are the result of anticipated industry needs. Some of the developments are related to the protection of both locally-produced and imported dry agricultural products, and the preservation of fodder for livestock.

Post-harvest research concentrates on protection, preservation, treatment, processing, storage and transportation of fresh, dried and processed foods. This research is conducted under disciplines that include physiology, physics, chemistry and biochemistry, molecular biology, microbiology, and entomology. The research activities related to post-harvest science of fresh produce are concerned mainly with maintaining the quality of fresh fruits, vegetables, and floral and ornamental products after harvest, in order to improve marketability for export. Special efforts are being devoted to finding and developing alternatives to chemical methods for the control of post-harvest pathogens and pests. These alternatives include the reinforcement of host resistance, biological control and applications of physical treatments. The basic research projects deal with physiological, pathological, biochemical and molecular aspects of fruits and vegetables after harvest.

Various fresh fruits (citrus, tropical, subtropical, deciduous), vegetables (leafy, root and others) and fresh herbs grown in Israel are the subjects of the following fields of study:

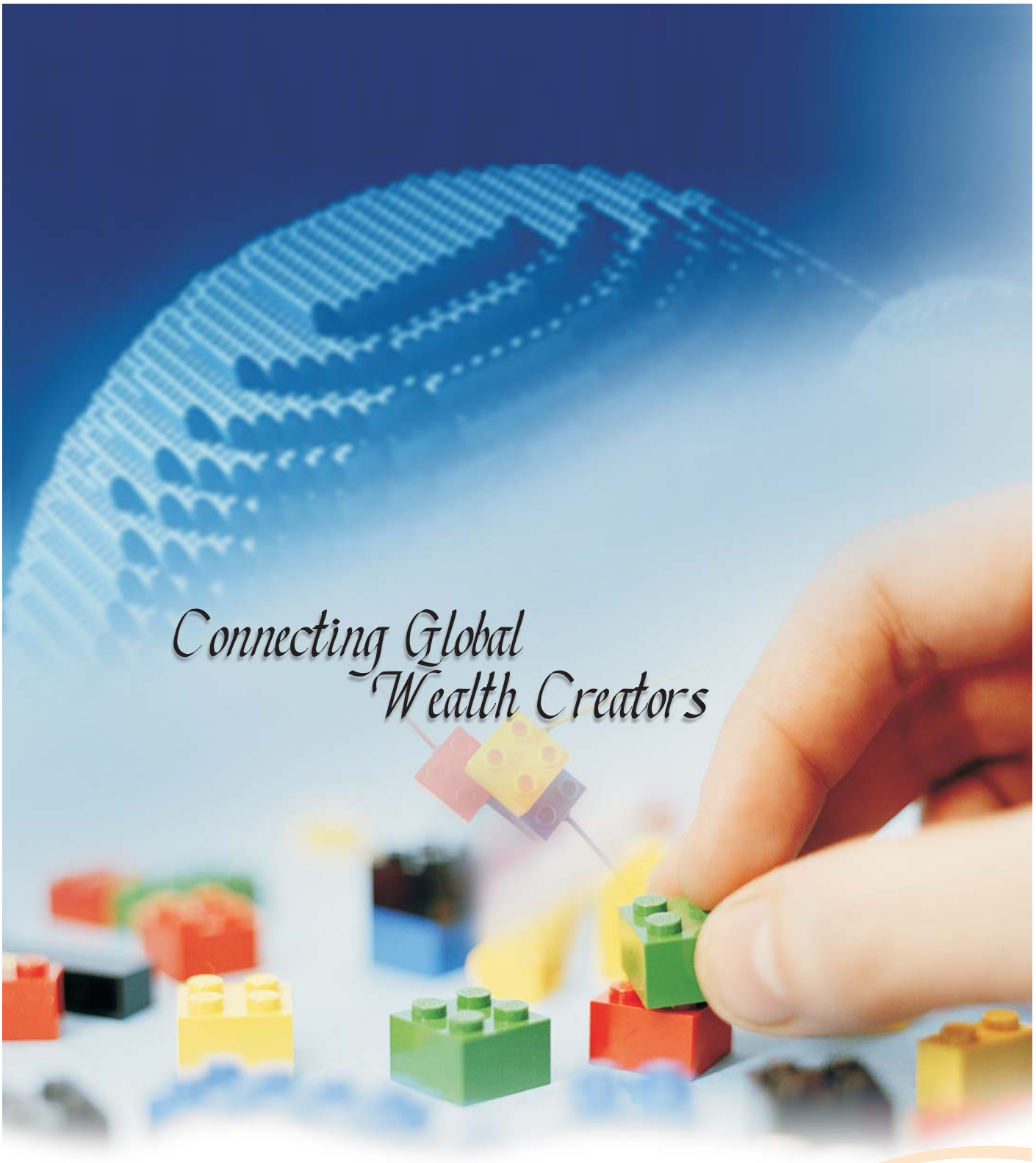
• Post-harvest physiology, biochemistry and molecular biology

• Control of post-harvest rot causing fungi and bacteria, and study of host-parasite interactions

• Post-harvest technologies, such as handling, disinfection, waxing, packaging, cooling, degreening, fumigation and gassing

• Optimal export and storage conditions.

Israel's post-harvest activities are carried out in cooperation with other ARO units, with the Agricultural Extension Service, growers, farmers' organizations and agriculture-related companies in Israel, and with counterpart institutes overseas. ■



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Crop Protection:

Ensuring Crops Meet High Export Standards

Through its unique geographic location, Israel acts as the southern border for temperate zone pests, such as the late blight of potato, and as the northern border for tropical pests, such as the Egyptian cotton leafworm (Spodoptera littoralis). In general, Israel suffers from many parasitic insect pests, diseases and weeds. A wide array of new pests intrude annually, either air-borne or carried on imported plant material. This particular situation requires a dynamic crop protection system.

Most of Israel's agricultural production is highly intensive, based on small farm units which need close advisory work and regular technical updates. Production is export-oriented and has to comply with the severe quality requirements of the western marketplace.

Integrated Pest Management (IPM)

The protection of all crops in the country is based on the guiding principle of Integrated Pest Management (IPM) as requested by both the domestic and export markets. IPM focuses on a reduction of chemical pest control and protection of the environment. In more practical terms, this means spraying only when necessary, preferring environment friendly chemicals, and promoting the use of biological control in a series of crops such as avocado, strawberry, pepper and citrus. A parallel supporting activity consists of the wide adoption of pest monitoring and improved decision-making on pest management and control. Three basic pest management concepts are being used: conventional pest control, supervised control and IPM. The technical policy is to expand the acreage under IPM, and, indeed, 25% of the country's fruit crop area is already being managed according to an IPM regime.

Chemical Control

Chemical control is still part of an IPM system. IPM rationalizes chemical control and combines it with non-chemical control means. Israel's agrochemical industry is spearheaded by the world's largest generic pesticide manufacturer, which also produces a bio control agent for the control of graymold, and another large chemical firm, which after producing methyl bromide an ozone-depleting soil fumigant earmarked for phase out by the Montreal Protocol moved recently into the manufacturing of methyl bromide alternatives.

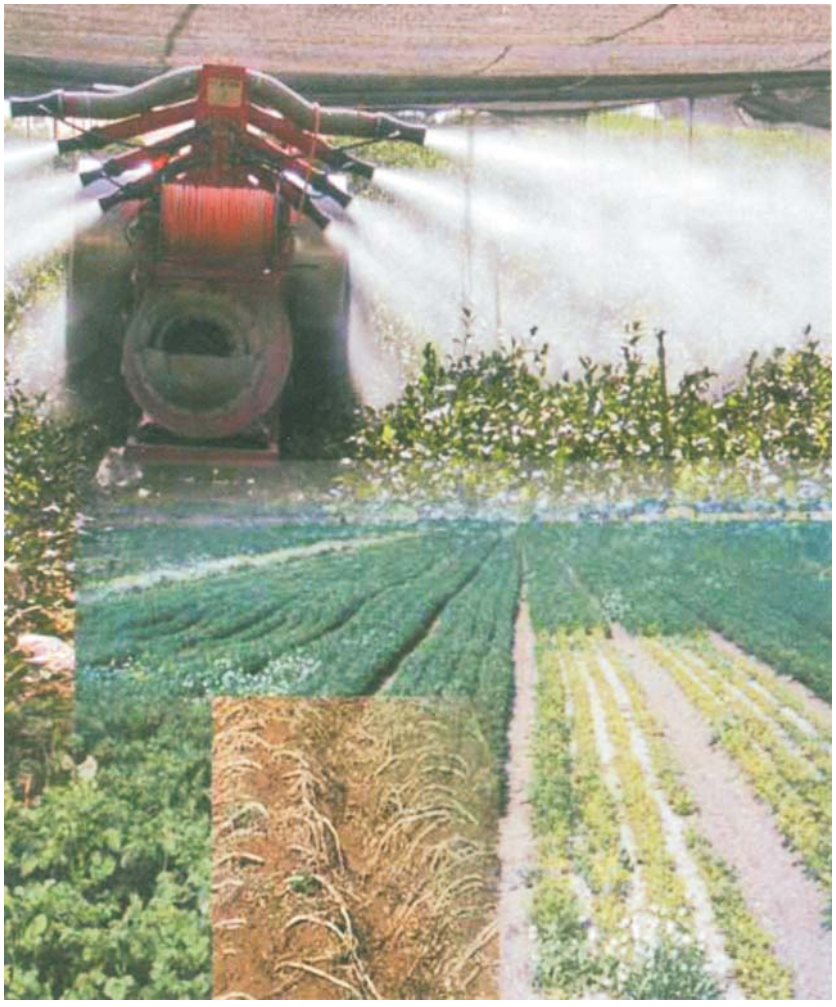
Flow of Crop Protection Information

The crop protection extension system of the Ministry of Agriculture and Rural Development cooperates with public research, the Plant Protection and Inspection Services, which is the Ministry's regulatory agency, and the chemical industry. This close collaboration and networking ensures that the main problem areas where there are newly intruding pests and pests causing severe losses are dealt with in a well-coordinated way at pesticide registration and recommendation levels for the benefit of the end-users, who are the growers.

Technological Developments in Crop Protection

The quality requirements of the export markets and the goal of adopting non-chemical pest control practices induced the crop protection technical establishment research, extension, and industry to sustain an R&D approach and apply its new and sophisticated technologies on the ground.

Following are examples of technological developments:



• Soil solarization, which has been applied for over two decades, utilizes solar energy for the control of soil-borne pathogens,root-knot nematodes, insect pests and weeds.

• Insect-proof screens reduce the intruding sucking insect populations and the subsequent infestation with viral diseases. This development accompanied the massive growth of the greenhouse industry and the transfer of intensive crops from outdoor to indoor conditions.

• UV-absorbing plastic sheets and screens cause spatial disorientation of the sucking insects' flying habits, reducing direct losses caused by their sucking and the transfer of viral diseases.

• Various insect traps have been developed and applied for both pest monitoring and for the reduction of insect populations.

• Pheromone traps are used in most of the country's cotton fields for monitoring as well as for disrupting communication between male and female pink bollworm moths.

• A biocontrol agent based on Trichoderma harzianum controls graymold on several indoor vegetables and grapes. This compound was developed by public research and is now commercially manufactured by the private sector.

• Sticky color panels are used indoors for monitoring and mass trapping of sucking insects. Yellow panels are used to control whitefly and blue ones to control western flower thrips.

Grafting is becoming more common. Almost fifty percent of the watermelon grown in the country is grafted on squash which is resistant to soil-borne and viral diseases.

Market Requirements

Israeli farmers who export face rigorous consumer demands. As such, management practices have to comply with the exacting demands of major European and US supermarket chains, as well as with international standards such as the International Standards Organization (ISO), EurepGAP and Tesco Natural Choice (TNC). ■

Agriculture in India:

Slow and Steady Growth

Agriculture is the backbone of Indian Economy. About 65% of Indian population depends directly on agriculture and it accounts for around 22% of GDP. Agriculture derives its importance from the fact that it has vital supply and demand links with the manufacturing sector. According to the Annual Report 2009-2010 of the Ministry of Agriculture the total geographical area of India is 328.7 million hectares of which 140.3 million hectares is net sown area, while 193.7 million hectares is the gross cropped area.

During the past decade agriculture sector has witnessed spectacular advances in the production and productivity of food grains, oilseeds, commercial crops, fruits, vegetables, food grains, poultry and dairy. India has emerged as the second largest producer of fruits and vegetables in the world in addition to being the largest overseas exporter of cashews and spices. Further, India is the highest producer of milk in the world.

India has diverse agro-climatic zones from north to south and from east to west. It has been divided into fifteen different agro-climatic zones, which signifies its diversified agricultural production from tropical to temperate crops. India has what is called the monsoon climate, in which a year has been divided into two distinct seasons of summer and winter. Rainfall occurs mainly in summer. India has a strong weather forecasting system developed and maintained by Indian Meteorological Department (IMD). Apart from weather forecasting and severe weather warning, it also gives agro meteorological services to farmers in India.

Today, India ranks second worldwide in farm output. Agriculture and allied sectors like forestry and logging accounted for 16.6% of the GDP, employed 52% of the total workforce and despite a steady decline of its share in the GDP, is still the largest economic sector and plays a significant role in the overall socio-economic development of India.

India is the largst producer in the world of fresh fruit, anise, fennel, badian, coriander, tropical fresh

fruit, jute, pigeon peas, pulses, spices, millets, castor oil seed, sesame seeds, safflower seeds, lemons, limes, cow's milk, dry chillies and peppers, chick peas, cashew nuts, okra, ginger, turmeric guavas, mangoes, goat milk and buffalo milk and meat, Coffee. It also has the world's largest cattle population (281 million). It is the second largest producer of cashews, cabbages, cotton seed and lint, fresh vegetables, garlic, egg plant, goat meat, silk, nutmeg. mace, cardamom, onions, wheat, rice, sugarcane, lentil, dry beans, groundnut, tea, green peas, cauliflowers, potatoes, pumpkins, squashes, gourds and inland fish. It is the third largest producer of tobacco, sorghum, rapeseed, coconuts, hen's eggs and tomatoes. India accounts for 10% of the world fruit production with first rank in the production of mangoes, papaya, banana and sapota.

Tea, Coffee, and Natural rubber are the main plantation crops in India that contribute to Indian export in a considerable way. India is the largest producer and consumer of tea in the world. It contributes 4% to global coffee production and enjoys a niche market by producing both arabica and robusta coffee. In rubber also, it ranks third in production and fourth in consumption of natural rubber in the world.

India has a great potential in the production of horticultural crops, which includes fruits, vegetables, spices, floriculture, and plantations. Acreage under horticulture is around 20 million hectares. India is the second largest producer of both fruits and vegetables in the world. It occupies first position in the production of cauliflower, second in onion, and third in cabbage.

India ranks first in the world in milk production. Strong networks of Milk Cooperatives, have been instrumental in this phenomenal performance of the dairy sector in India. Presently, 1.13 lakh village level cooperative societies spread over 265 districts in the country form part of the national Milk Grid. This Grid links milk producers throughout India and consumers in 700 towns and cities. De-licensing of dairy sector in 1991 has directed considerable amount of private funds both from inside and outside country in this sector especially in manufacturing facilities while investment in cooperative sector are concentrated largely in procurement and processing of milk.

Livestock sector contributes about 27% of the G.D.P. from agriculture and allied activities. This sector has excellent forward and backward linkages, which promote many industries and increase the incomes of vulnerable groups of the society such as agricultural labourers and small and marginal farmers. India possesses the second largest livestock population in the world.

Production and export of poultry products have shown considerable growth in the recent decades. Export of such products to countries including Bangladesh, Srilanka, Middle East, Japan, Denmark, USA, and Angola augers well for this industry.

Fishing, aquaculture and a host of allied activities are a source of livelihood to over 14 million people and a major source of foreign exchange earner. This sector contributes about 1% of G.D.P. and 5.3% of G.D.P from agricultural sector. 8,118 k.m. of coastline gives geographical basis for the development of marine fishery sector and cultural factor boosts the inland fishery sector in India.

Mechanization in Indian agriculture is still at a rudimentary stage showing regional variation. But it is

increasing over the years. Power availability for carrying out various agricultural operations, which is one of the indicators of mechanization, has increased considerably.

According to the World Bank, the allocation of water is insufficient and unsustainable. The irrigation infrastructure is deteriorating. At some places the overuse of water is currently being covered by pumping facility but as these are falling by foot of underground water each year, this is a limited resource. Secondary, farmers in India are mostly illiterate, socially economically backward or incapable of developing new ideas. They are inadequate or inefficient to implement fast and progressive actions. Farmers are facing the problems of finance and lack of marketing services for farm produce.

The government is giving agriculture its highest priority. The 11th Plan is considerably higher over the 10th plan. An amount of US$19 billion has been allocated for the Ministry of Agriculture during the Eleventh Five Year Plan. Agriculture is one of the strongholds of the Indian economy and

accounts for 14.6 percent of the country's gross domestic product (GDP) in 2009-2010, and provisional percent of the total export is 10.23 percent. Moreover, the agriculture sector provides employment of 52 to 55 percent of the work force.

As per the Centre for Monitoring Indian Economy (CMIE) farm output will grow by 10 percent to 114 million ton (MT) in the Kharif season, while in winter season(Rabbi season) it is expected to increase to about 116.6 MT. According to Agricultural and processed Food Products Export Development Authority (APEDA) India's exports of fruits, vegetables, cereals and processed food products was worth US$ 1.14billion during April May 2010-11. Middle East, Asia, Africa, and South America are developing countries in which 70 percent of the India's agriculture and processed food is being exported.

In recent times, there has been an increasing demand for organic foods in the developed world. Organic farming is an important pillar of sustainable agriculture, which is beneficial for producers and consumers both. India has great potential in organic farming using traditional wisdom and methods prevailing in the villages of India. In fact, a large section of Indian agriculture follows more or less an organic method of farming using minimum level of chemical inputs. Promotion of organic farming in India could prove beneficial to increase the share of Indian agricultural produce in world exports. ■

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ISRAEL, GENERATIONS OF INNOVATION

THE NATIONAL PROGRAM FOR PROMOTING WATER TECHNOLOGIES

The Israeli water market is internationally conceived as highly developed, benefiting from the several years of experience in managing scarce water resources, while the national industry is widely regarded as a nexus of world-class expertise in the water field. The volume of Israeli water-related industrial export has doubled between 2006-2009, the sector numbers about 200 companies using a range of technologies.

Israel is considered a world expert in the fields of desalination, water treatment and reclamation, water safety, and agricultural water consumption via drip irrigation – an Israeli innovation.

The country's specific needs have brought about a number of prominent developments:

- Several of the world's largest RO desalination plants are located in Israel (Ashkelon and Hadera)
- World leadership in using recycled water (about 75% of agricultural consumption)
- One of the world's most advanced systems of wastewater treatment and decontamination
- Unique integrative management of varied water sources
- Construction, operation and maintenance of the one-of-the-kind national water carrier

THE NATIONAL PROGRAM FOR ALTERNATIVE ENERGY TECHNOLOGIES

Based on decades of Israeli experience in the field of renewable energy and recognizing the strategic importance of alternative energy technologies, the government of Israel launched in 2008 the National Program for Alternative Energy Technologies - the NEWTech renewable energy sector. The objective of the program is to keep Israel"s renewable energy industry at the forefront of the global arena. Israeli alternative energy companies are considered industry pioneers in solar and geothermal technologies.

Quoted from the National Programe website

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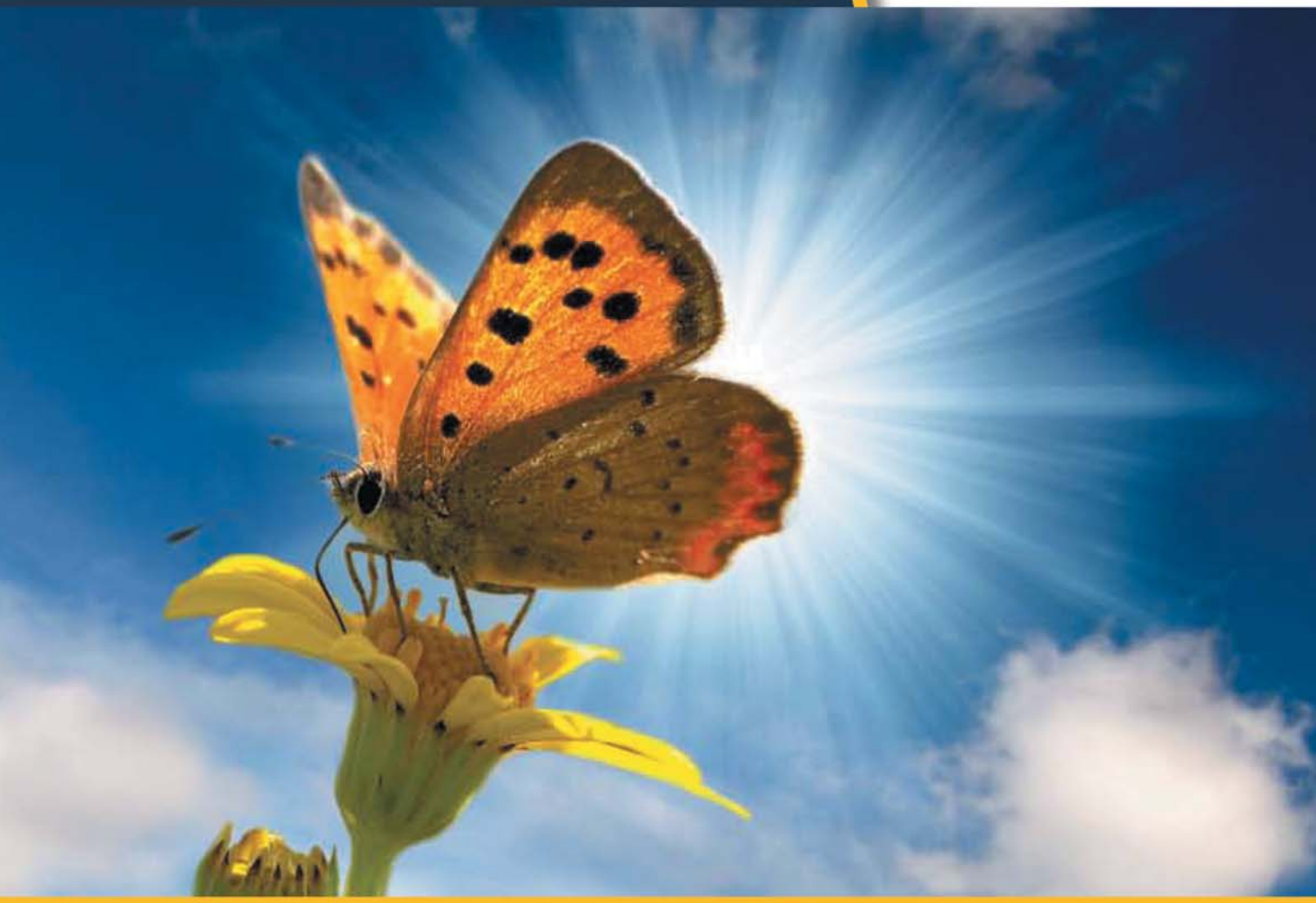

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