

# ISRAEL - NATIONAL REPORT CSD-18

## CHEMICALS

### **Introduction**

The chemical industry plays an important part in Israel's economic development, comprising some 20% of GDP by industry and a growing share of the country's exports (from 11.1% in 2000 to 22.1% in 2008).

Safe use and regulation of chemicals is an essential component of Israel's environmental policy. The main frameworks for chemical management in Israel are the Licensing of Businesses Law, 1968 and the Hazardous Substances Law, 1993. Enforcement includes supervision on the sales and acquisition of chemicals and supervision on the import of chemicals (by Israeli Customs).

Moreover, in recent years, an Integrated Pollution Prevention and Control (IPPC) approach was introduced into the major industrial hotspots: Ramat Hovav in the south, Ashdod on the southern Mediterranean coast and Haifa Bay in the north of the country.

### **Assessment of Chemical Risks**

#### **Mechanisms for systematic evaluation, classification, and labeling of chemicals, including initiatives towards a harmonized system of classification and labeling of chemicals**

At present, the existing frameworks for industrial chemical management in Israel regulate the user of chemicals by means of stringent measures for "cradle to grave" supervision of the production, import, storage, storage, processes, wastes and transport of chemicals. A tender for comparative analysis of different chemical management systems, including REACH in Europe and TSCA in the USA, was published in 2010, to be followed by selection of the preferred mechanism for chemical management in 2011. It is anticipated that a new administrative unit for chemical assessment and registration will be set up in 2012 and that implementation will commence in 2013.

**Following is a short synopsis of the mechanisms currently in use in Israel:**

- **Hazardous Materials Permit:** Under the Hazardous Substances Law (1993), a Hazardous Materials Permit is required for the holder of any chemical, whether the substance is in its simple form, mixed, or blended. A permit is only granted if the official appointed by the Minister of Environmental Protection is satisfied with the applicant's familiarity with the features of the hazardous substances in his possession and with their safety requirements. Permits specify the types, quantities and compositions of chemicals in the facility. They also impose restrictions on the quantities and conditions of use of these materials for the protection of man and the environment. The holder of a permit is required to maintain a hazardous substances register in which details of all sales and purchases of hazardous substances are recorded. These record books facilitate tracking of the movement of hazardous substances throughout the country and illegal trade. A fully computerized system classifies all permit holders into sectors and categories.
- **Israeli Standard for Labeling and Marking of Dangerous Substantives:** Israel Standard (IS) 2302 on *Classification, Packaging, Labeling and Marking Dangerous Substances and Preparations* (revised in 2009) presents a mandatory harmonized system that regulates the labeling of chemicals (partly correlating to the EEC Dangerous Substances Directive). IS 2302 specifies labeling requirements for chemicals in-house, during transport from facility to facility within the same compound, and during the transport of dangerous substances by road or rail.
- **Labeling of transported chemicals:** Regulation of the transport of hazardous substances rests with the Ministry of Transport. The ministry imposes specific requirements for packing, labeling and vehicle marking. The Transport Services Law of 1997 and its 2001 regulations regulate the transportation of dangerous substances and largely correspond to the UN Recommendations on the Transport of Dangerous Goods - Model Regulations (The Orange Book). All transported hazardous substances are marked according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) and include information on the manufacturer or importer of the substance, warning

marks, emergency codes, action to be taken, UN number, and telephone number of an information center.

Additionally, while Israel has not yet formally ratified the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) and its protocol, it implements most of the provisions in practice.

- **Information and Response Center for Hazardous Substances:** The Information and Response Center collects quantitative and qualitative information on hazardous substances that are used, produced, imported, exported, transported and disposed of in Israel. Data relate to quantities, types, characteristics and concentrations of substances found in all sectors and at all levels, including industry and institutions on the local, regional and national levels. In addition, the Center maintains data on safety, detection, identification, treatment, and neutralization procedures for chemical accidents.

#### **Initiatives for assessment of toxic chemicals, hazard and risk assessment**

Currently, registration and licensing of chemicals is carried out on pesticides, pharmaceuticals, cosmetic preparations and food additives.

Pesticides used for agricultural and public health purposes constitute a significant percentage of all chemicals in Israel. The use of these pesticides is carefully supervised to ensure environmental health and safety. The Ministry of Agriculture's Plant Protection and Inspection Service is in charge of the registration and regulation of pesticides for plant protection – constituting most of the pesticides used in Israel. The Veterinary Services of the Ministry of Agriculture use the same process to register pesticides for veterinary use. Monitoring of pesticide residues is carried out by the Ministry of Agriculture and the Ministry of Health.

#### **Registration of Pesticides for Agricultural Use**

The pesticide registration process begins with testing and investigation over a period of two years, following provisional approval for limited use. When comprehensive toxicological data have been gathered, an advisory committee, composed of representatives of several ministries, including Environmental Protection, Health, Industry, Trade and Labor, as well as representatives of consumers, decides whether

to approve the product for final registration. Materials are assessed for their environmental impact, endurance, risk to groundwater and other factors.

For the purpose of registration, the Pesticides Division of the Plant Protection and Inspection Services has established criteria for submitting a toxicology file to the interministerial committee for coordination of pesticide use. The criteria are largely based on European directive 91/414/EC concerning the placing of plant protection products on the market

### **Registration of Pesticides for the Protection of Public Health**

The registration process for pesticides for public health purposes is separate from that for agricultural use. Israel's regulations, approved in 1994, comply with strict international standards and require applications for the registration of a new molecule, new formulation, renewal and change of name/label/packaging, etc. The regulations require the officer responsible for pesticide registration to consult with an interministerial professional committee, composed of representatives of the Environmental Protection and Health Ministries. Applications must be accompanied by specification of the composition of the pesticide, copy of the proposed label, toxicological file on the impact of the material on humans, the environment, flora and fauna, material safety data sheet, and more.

### **Registration of Pharmaceuticals**

The Pharmaceutical Administration of the Ministry of Health is responsible, *inter alia*, for the registration of drugs. Each application is accompanied by detailed documentation that relates to the results of a wide array of clinical and other experiments. Registration is only granted following thorough review of these documents as well as the receipt of a certificate of quality from the Institute for the Standardization and Control of Pharmaceuticals

### **Emergency Response and Risk Assessment**

The Information and Response Center for Hazardous Substances assists response teams during emergencies. It conducts assessments based on data received from the field, such as location, type of hazardous substance, type of incident (including spills,

odors, fires, explosions and transport related accidents, etc.) and, at times, data collected previously on materials held on site and on scenarios.

The Center uses both computerized databases that include information sheets on response during accidents and software on analysis of accidents in which hazardous substances are involved. Software for calculating the dispersion range of pollutants in the atmosphere is used to provide estimates within minutes. Other types of software facilitate calculation of risk ranges of flammable and explosive materials.

### **Risk Management Plan**

A risk management manual which relates to risk reduction from industrial sources involving chemicals and to minimizing their impacts on public health and the environment was published by the Ministry of Environmental Protection. According to the manual, any premise which is subject to a Hazardous Materials Permit for a regulated substance and is included in a list of especially toxic or flammable substances is required to prepare a risk management plan. The risk management plan, largely based on the California Accidental Release model (CalARP), includes, *inter alia*, the following elements:

- An offsite consequence analysis that evaluates specific potential release scenarios, including worst-case and alternative scenarios.
- A 5-year history of accidental releases of regulated substances from the covered processes.
- An integrated risk prevention program.
- An emergency response program that includes a set of actions to be taken in different contamination scenarios by the industry and external aid and rescue forces.

A pilot program was initiated by the Ministry of Environmental Protection, with the participation of three industrial plants in each district. The industrial plants were required to prepare and submit risk management plans according to the format prepared by the ministry.

## **Participation in various international and regional initiatives**

The State of Israel has signed and/or ratified several international treaties on the use of chemical substances:

- **The Stockholm Convention on Persistent Organic Pollutants (POPs):** Israel signed the Stockholm Convention in May 2001 and intends to proceed with its ratification. Both the Ministry of Agriculture and the Ministry of Environmental Protection largely comply with the provisions of the convention. Moreover, the pesticides listed in Annex A and B of the convention are banned in Israel. A tender will be issued in 2010 to assess the steps needed for the ratification and implementation of the convention.
- **The Rotterdam Convention on Prior Informed Consent Procedure for Hazardous Chemicals and Pesticides (PIC):** Israel signed the Rotterdam Convention in 1999 and expects to ratify it in 2010. At present, the convention is partially implemented by means of import licensing requirements for chemicals associated with security, health and environmental risks.
- **The Basel Convention on the Transboundary Movement of Hazardous Waste:** Israel ratified the Basel Convention in December 1994. National regulations on the import and export of hazardous waste, which were promulgated in 1994, provide the legal basis for implementing the convention in Israel.
- **Vienna Convention on the Protection of the Ozone Layer and Montreal Protocol on Materials that Deplete the Ozone Layer:** Israel ratified the Vienna Convention and the Montreal Protocol in 1992 and promulgated regulations for the implementation of the Protocol in 2003.
- **Strategic Approach to International Chemical Management (SAICM):** Israel was part of the Dubai declaration. Many of the country's laws, regulations, activities and know-how facilitate the move toward SAICM in Israel.

**Strategies for exposure assessment and environmental monitoring and improvement in procedures for using toxicological and epidemiological data to predict and estimate the effects of chemicals on human health and the environment**

### **Recommendations on Guideline Values for Chemical Pollutants in the Air**

A report entitled "Ambient Guideline Values for Chemical Pollutants in the Air" was published in March 2006, with guideline values for 110 chemical pollutants in the air which are considered harmful to human health. The guidelines define, for each of the chemicals, both long term exposure limits and short term exposure limits. The Ministry of Environmental Protection has adopted these guideline values and uses them as essential tools in decision making processes on the following:

- Approval and licensing of new facilities in industry or expansion and changes to existing facilities;
- Reviews of health risks to the population in case of exposure to a given pollutant; and
- Assessment of the necessity to reduce pollutant emissions from different sources if pollutant concentrations in the air exceed guideline values.

### **Sampling of Exotic Pollutants in Haifa Bay**

Within the framework of the action plan for the prevention of industrial air pollution in Haifa Bay, an air quality sampling project was implemented in 2007 and 2008. The following air pollutants were sampled: suspended particulates, heavy metals, hydrogen chloride, ammonia, hydrogen sulfide, mercaptans, volatile organic compounds, polyaromatics, dioxins and furans, aldehydes and ketones. In each of the measurements, air was collected for a 24 hour period and the contents were analyzed in specialized laboratories to determine the composition and concentration of the substances in the air. The findings were analyzed and compared to ambient air quality standards and to the recommended health guideline values, enabling the Ministry of Environmental Protection to identify existing and potential emission sources and to take steps targeted at reducing pollution emissions.

### **Protecting Public Health**

The Ministry of Health is responsible for protecting public health including, *inter alia*, supervision of drinking water quality and regulation of chemical, pesticide and herbicides residues and hormones in food. The specialized units in the Ministry of Health that deal with environmental health include the Environmental Health Unit which supervises the quality of drinking water supplied to the public and issues permits for wastewater irrigation food related businesses, and the Public Health

Additionally, the Ministry of Health, in cooperation with the Ministry of Environmental Protection, coordinates many epidemiological surveys. Following are some examples:

- Cancer, death, children's sicknesses and hospitalization were studied between 1990 and 1999 in the Hadera area, near a coal power station;
- Association between air pollution and daily counts of hospital admissions and emergency rooms visits were studied in the Haifa metropolitan area between 1996-1999;
- Prevalence of cancer, lung diseases, cardiovascular diseases and breathing problems were studied in the Haifa area where the petroleum industry is concentrated, during 1995-2004;
- Beginning in 1990, a survey related to allergies, asthma, lung diseases and emergency room admissions was conducted in the Ashdod and Ashkelon area where coal power stations operate;
- A few surveys were conducted in the Tel Aviv metropolitan area regarding the relation between air pollution and many symptoms. One was carried out in collaboration with the US Environmental Protection Agency (EPA);
- A long term study (1994-2005) was conducted around the Ramat Hovav industrial area. The survey monitored cancer prevalence, lung diseases, cardiovascular diseases, newborn malformations, admittance to emergency rooms, hospitalization, mortality and particularly newborn mortality;
- A 10 year survey was recently initiated among soldiers working near the Ramat Hovav industrial area.

### **Risk in the Workplace**

Israel's main arm for supervising safety regulations is the Labor Inspection Service of the Ministry of Industry, Trade and Labor. The Labor Inspectorate is responsible, mainly as a regulator, for workers' health and safety in all workplaces and has focused on especially hazardous substances which put more workers at higher risks. The Labor Inspectorate also promotes applied and basic research in all relevant fields,

including the development of databases. It has published several regulations regarding specific dangerous substances:

- Total banning of materials considered to be carcinogenic.
- Setting of threshold limit values for exposure to such materials as benzene, vinyl chloride, arsenic, mercury, lead, halogenated hydrocarbons, aromatic hydrocarbons, isocyanides, organic phosphates and carbamates, metals such as cadmium, nickel, chromium, cobalt and beryllium.

### **Carcinogenic, Mutagenic and Teratogenic Materials**

National concern over the long-term health effects of a number of materials has led to the establishment of an interministerial committee on carcinogenic, mutagenic and teratogenic materials. The committee chairman is the general director of the Ministry of Health, and the committee includes representatives of the Ministry of Industry, Trade and Labor, Ministry of Agriculture, Ministry of Environmental Protection, Israel Institute for Occupational Safety and Hygiene, and Israel's health care services (Sick Funds). The committee acts as the professional body for assessing the effects of chemicals on human health and advising on ways and procedures to prevent or minimize the negative health impacts of exposure to chemicals. The committee is responsible for updating the lists of substances that are considered to be carcinogenic, mutagenic and teratogenic.

## **Sound Management of Toxic Chemicals**

### **Progress within the larger framework of Strategic Approach to International Chemicals Management (SAICM)**

Israel endorses the Strategic Approach to International Chemicals Management (SAICM), took part in the Dubai declaration and nominated a focal point for SAICM.

Relevant government agencies work according to the SAICM when formulating their work plans and regulative instruments in order to achieve risk reduction, governance, accountability and responsibility. Furthermore, special attention is paid to increasing public awareness, transparency and participation and ensuring wider technical cooperation among all stakeholders. Currently, Israel is in the process of forming an interdisciplinary committee for SAICM and of screening gaps and activities needed.

Israel already implements some elements of SAICM within the framework of its laws, regulations and activities. Examples include:

- Commitment to the Responsible Care program by many member companies of the Manufacturers Association of Israel.
- Establishment of Community Advisory Panels (CAPs) in which representatives of chemical companies, regional NGOs and the public take an active role.
- Adoption of the ethical code of the International Federation of the Pharmaceutical Manufacturers' Association by the Manufacturers Association of Israel.
- Establishment of an Israeli Cleaner Production Center in 2001, as a joint project of the Manufacturers Association of Israel and the Ministry of Environmental Protection.
- Initiation of a pilot program by the Ministry of Environmental Protection, requiring industry to submit risk management plans, based on the Californian guidance document and the US Risk Management Program guidelines.

Future plans include:

- Establishment of an Industrial Chemicals Registration Mechanism, with implementation expected to commence in 2013
- Establishment of a Pollutant Release and Transfer Register (PRTR), with a pilot study planned for 2010 and gradual implementation beginning in 2012.

### **Initiatives and innovations for risk reduction, particularly taking in to account the life cycle of the chemicals**

Israel has a wide body of legislation and programs aimed at the reduction of risks from existing chemicals, such as workers' health and safety provisions; requirements for Material Safety Data Sheets (MSDS); official standards on the classification, labelling, packaging and marketing of industrial chemicals; terms and conditions in Hazardous Materials Permits, surveys and monitoring programs.

Moreover, the Ministry of Environmental Protection regularly reviews information about chemicals that may pose health and environmental risks. In accordance with this information, policies are prioritized restricting the use chemicals that have multiple influences in their lifecycle.

**Policy measures to phase out chemicals that pose unreasonable and unmanageable risk to human health and human environment, such as, for example, ozone-depleting substances**

### **Ozone-Depleting Substances**

Israel signed, ratified and implements the Montreal Protocol and its subsequent amendments. Israel's regulations on the subject relate to:

- Reduction of methyl bromide consumption;
- Halons;
- Chlorofluorocarbons (CFCs);
- Reduction of hydrochlorofluorocarbons (HCFCs) consumption.

The Ministry of Agriculture established a procedure for distributing the approved methyl bromide quantities for plant protection while the Ministry of Environmental Protection is responsible for distribution of methyl bromide for uses related to structures, commodities and objects. The distribution of methyl bromide quantities for critical uses is granted according to the amounts allocated by the parties to the Montreal Protocol for critical uses in Israel. Since 2005, the use of methyl bromide is restricted and controlled by the Ministry of Agriculture jointly with the Ministry of Environmental Protection.

Reduction in methyl bromide for uses other than plant protection has been achieved by implementing the following alternatives:

- Integrated pest management;
- Thermal disinfection;
- Mixture of methyl bromide\CO<sub>2</sub> – allowing for a reduction in methyl bromide dose by 50% (used for date packing houses);
- Controlled atmosphere.

As of 2011, no methyl bromide will be allocated for post harvest dates (and for any other post harvest use) following the successful conclusion of a two-year research project, facilitating the use of heat in all post harvested date varieties. In addition, ethyl formate has recently been registered as an alternative for post harvested date treatment.

The Ministry of Environmental Protection is reviewing a revision to the existing regulations aimed at further restricting the use and control of ozone depleting chemicals. The revision would include aspects such as:

- The provisional use of recycled containers rather than disposables;
- Safe procedures for maintenance and installation of air conditioning systems (avoiding ODS emissions);
- Recovering controlled materials from machinery and equipment during servicing or prior to disposal.

Some of the proposed regulations are already in effect as official standards. For example, the obligatory standard for air conditioners was amended in 2005 to prohibit the use of HCFCs in new air conditioners. Using the same tool, the use of HCFC 141B for most foaming materials has been restricted.

### **Pesticides and Biocides**

The use of pesticides for agricultural or public health purposes is carefully supervised to ensure environmental health and safety. In 1997 a revision of all registered pesticides and biocides was initiated, resulting in the ban of 11 active ingredients. Emphasis was given to restricting or banning chemicals that were previously authorized for use. Specifically, chemicals with long DTs (time required for 50% of the initial deposit to dissipate) are not granted a sales license.

The following materials were banned or severely restricted after 1997:

1. Sodium Arsenite
2. Pentachlorophenol
3. 2,4,5-TP
4. Monocrothophos

5. Ethyl Parathion
6. Chlorphenapyr
7. Aldicarb
8. Hexasuron
9. Dinitro-o-cresol
10. Methoxyethylmercuric chloride
11. Ethylmercuric chloride

In addition to agricultural pesticides, Israel regulates (by a separate process) pesticides for public health purposes and wood preservatives. The regulations stipulate a number of cases in which registration may be denied, revoked, suspended or made conditional upon the fulfillment of prerequisites. Registration may be denied, for example, if the pesticide poses a risk to humans, the environment, flora or fauna. It may also be denied if another registered pesticide exists for the same purpose, which is less harmful to humans, the environment, flora, or fauna, or if the pest has developed resistance to the active ingredient as demonstrated by testing in the Entomological Laboratory of the Ministry of Health.

Based on these conditions, several formulations have either not been approved or have been revoked or restricted in recent years, including:

- **Acute rodenticides:** Acute rodenticides containing fluoroacetate or zinc phosphide have been banned in the public health sector due to their toxicity to humans and the environment and due to the lack of an effective antidote. The revocation was made possible by the existence of alternatives such as anticoagulants.
- **Chromated Copper Arsenate (CCA) for wood preservation:** CCA is the general term for chemical formulations containing three components: inorganic arsenic, six-valent chromium and copper, used to protect wood from pests. Inorganic arsenic and six-valent chromium have been defined as known carcinogens. In light of potential dangers during fire and during wood processing and in light of indicators about the possibility of the leaching of carcinogenic materials to the environment due to wear processes and in accordance with the precautionary principle, Israel decided not to approve

formulations for wood protection which contain CCA and to approve alternative wood preservatives. In parallel, Israel decided to ban the import and processing of wood treated with these materials.

- **Chlorpyrifos and diazinon:** The Ministry of Environmental Protection has banned the use of pest control products containing the organophosphates chlorpyrifos and diazinon. In recent years a growing body of evidence has accumulated regarding previously unknown risks from these materials, including to embryos and infants due to the exposure of pregnant women and babies to chlorpyrifos and diazinon.

### **Policies and frameworks for prevention of accidents, preparedness and response**

In case of accidents involving hazardous substances, an integrated emergency response system is imperative. To this end, Israel has developed a national emergency contingency plan for integrated emergency response in hazardous substance accidents. The plan's main aims are to rescue human life, prevent and reduce risk to the population and minimize environmental damage. The plan delineates the tasks of the bodies that will participate in the response, both individually and collectively, including the police, the fire and emergency services, and the Ministry of Environmental Protection.

### **Entities and Responsibilities**

- The police – responsible for commanding and coordinating treatment at the site of the accident;
- The fire and emergency services – responsible for initial activities at the site of an accident (extinguishing fires and evacuating casualties);
- MDA (ambulance service) – responsible for clinical diagnoses and prioritizing the evacuation of casualties to hospitals after initial on-site treatment;
- The Ministry of the Environmental Protection – responsible for detection, monitoring, and risk assessment as well as for recommendations to the commander in charge on such measures as population evacuation, closure of surrounding areas, transfer of hazardous substances to the national hazardous waste disposal site at Ramat Hovav and site remediation.

### **Responsibilities of the Chemical Industry**

The plan imposes first responsibility for treatment of a chemical accident on the industrial plant itself. Israel's industries are required to take all necessary steps to prevent accidents, to prepare emergency procedures, to train staff, and to prepare suitable equipment and safety gear. In line with these requirements, the Manufacturers Association of Israel has prepared a comprehensive survey on potential means of dealing with chemical accidents that occur during the transport of hazardous substances.

### **Sequence of Actions**

The emergency response system is based on the division of the country into ten central risk areas. In case of a hazardous material accident, an immediate response team is dispatched to the site. The country's emergency bodies (police, fire and emergency services, and ambulance service) are required to arrive at the site within ten minutes of notification. The emergency response team of the Ministry of Environmental Protection must arrive within 30 minutes of notification.

In the case of the Ministry of Environmental Protection, six district offices, each with a designated response team and a mobile laboratory unit, are responsible for accidents occurring in the ten risk areas. The teams work under the professional guidance of the Hazardous Substances Division of the Ministry of Environmental Protection. The response team is responsible for preliminary assessment of the accident, detection and identification of the hazardous substances and risk assessment. The regional response teams are backed up by a national mobile unit that fulfills such services as response, calibration, equipment supply, maintenance, guidance and field advice to the district response teams and local units.

The Information and Response Center for Hazardous Substances plays an essential role in the system, coordinating among the various response forces, collecting data from the scene and from the Meteorological Service, performing complementary risk assessment and providing essential information and analysis services.

Major resources have been allocated toward implementation of the emergency contingency plan with special emphasis on training exercises and simulation

techniques as well as review of the theoretical literature. A special training center for hazardous substances was established by the Ministry of Environmental Protection to promote education and information in this area. The center instructs and trains all public services including the police, fire and emergency services, army units, hospitals and other medical services that deal with catastrophes involving hazardous substances.

**Policies aimed at reducing the risks posed by lead, mercury and cadmium and other harmful heavy metals, including through a review of relevant studies, such as, for example, the United Nations Environment Programme global assessment of mercury and its compounds**

**Mercury**

Emission and environmental standards for mercury are imposed in licenses and permits pursuant to the Licensing of Businesses Law, 1968 and Hazardous Substances Law, 1993. Israel has eliminated the use of alkyl-mercury compounds in agriculture and mercury compounds in the pulp and paper industry. Maximum possible reduction in the discharges of mercury from mercury cell chloralkali plants was achieved by the closure of a facility that did not comply with emission standards, and only one other mercury cell chloralkali facility currently exists in Israel. This facility substantially reduced its mercury emissions pursuant to the conditions of its Hazardous Materials Permit. Restrictions also exist for the use of mercury in toys.

**Lead**

The use of leaded gasoline has been banned in Israel. In addition, instruments such as laws and regulations, permits, licenses and official standards limit exposure to lead in areas such as: drinking water; workplace exposure to lead; effluent discharges from industry; irrigation water; permitted discharges to sea water; contaminated soil removal; and air emissions. Restrictions also exist for the use of lead in paints, toys and ceramic utensils. In addition, programs exist for the collection and recycling of lead-acid batteries and electronic waste.

**Initiatives to reduce overdependence on the use of agricultural chemicals**

Reduction of pesticide use is an important goal which aims to reduce environmental exposure to these materials. Pesticide regulations are meant to prevent potential

damage from uncontrolled exposure to pesticides. National Maximum Residue Limits have been established for all pesticides in Israel that are based, whenever appropriate, on the Codex Alimentarius Limits. The Ministry of Agriculture supervises and regulates quality and health requirements of exported agricultural produce and cooperates with international bodies on standardization of pesticide tolerance regulations.

In Israel, several projects have been initiated to promote integrated pest management. They include, among others, use of cover crops to protect the soil surface, insect-proof nets, insect traps, and natural enemies. Important progress has been made in the development and introduction of beneficial natural enemies (e.g., predatory mites, predatory beetles, parasitic wasps) as alternatives to conventional chemical pesticides. Projects range from the use of pheromone traps, to commercial production and application of the *Bacillus t. israelensis* (BTI) to control moth and water-breeding insects, to use of bees to biologically control strawberries from pests, to release of barn owls to effectively control rodent populations in farming areas.

The barn owl project, implemented at Kibbutz Sde Eliyahu, uses raptors as an environmentally friendly and economically profitable solution for eliminating rodents from agricultural fields and plantations. In January 2009, a contract was signed between the Ministry of Environmental Protection, the Ministry of Agriculture and the Society for the Protection of Nature in Israel to promote the use of barn owls and kestrels as biological control agents in agriculture. ([http://www.sviva.gov.il/Environment/bin/en.jsp?enPage=e\\_BlankPage&enDisplay=view&enDispWhat=Object&enDispWho=Articals^l6013&enZone=ipm](http://www.sviva.gov.il/Environment/bin/en.jsp?enPage=e_BlankPage&enDisplay=view&enDispWhat=Object&enDispWho=Articals^l6013&enZone=ipm)).

The development of organic agriculture promises further reductions in environmentally harmful agricultural practices. The Israel Bio-Organic Agriculture Association (IBOAA) is a member of the International Federation of Organic Agriculture Movement. Produce supplied by certified IBOAA growers is cultivated according to rigorous bio-organic principles: soil fertility is maintained through balanced organic nutrition and monitored plant rotation; insects, pests and disease are controlled solely by biological means, such as laboratory-bred natural enemies; produce is never treated after harvesting; and natural resources are carefully

conserved. Furthermore, greenhouses are heated only by the sun's rays and water is strictly rationed using Israel's advanced irrigation techniques.

Furthermore, Israel has enacted standards, laws and regulations on organic produce including the 2005 Law for Regulation of Organic Produce, the 2008 regulations on organic plants produce (production and sale, certification and preparations used during production) and the 2006 Israeli Organic Standard (Plants).