



ST. BENEDICT BISCOP BENEDICTINE CORPORATION

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GREENHOUSE TECHNOLOGY GLOBALLY: THE FUTURE OF FOOD

Today people in the food industry and governments around the world have come to realize the crucial need for green houses to supplement food supplies. St. Benedict Biscop Benedictine Corporation believes that the use of land for the creation of food to be as important as land used for hotels and resorts, industrial, and mining purposes. The need to create more green houses has become a challenge to supply an ever growing world population with more food. We will give you a little insight below into some of the predominant countries in the greenhouse industry. The countries in this report increase global food supply by means of greenhouses. They supply food for their own countries and export the rest. This not only feeds their people but offers employment to them as well. This is a double-edged sword for them in the struggle for economic advancement.

What is Greenhouse Technology?

Today about 92% of plants, raised by man, are grown in the open field. Since the beginning of agriculture, farmers have had to cope with the growing conditions given to them by Mother Nature. In some of the temperate regions where the climatic conditions are extremely adverse and no crops can be grown, man has developed technological methods of growing some high value crops by providing protection from the excessive cold and excessive heat. This is called Greenhouse Technology. Greenhouse Technology is the science of providing favourable environment conditions to the plants. It also protects the plants from the adverse climatic conditions such as wind, cold, precipitation, excessive radiation, extreme temperature, insects and diseases. An ideal micro climate can be created around the plants. Greenhouses are framed or inflated structures covered with transparent or translucent material large enough to grow crops under partial or full controlled environmental conditions to get optimum growth and productivity.

Some advantages of greenhouses:

1. Its yield may be 15-17 times higher than that of outdoor cultivation depending upon the type of greenhouse, type of crop, and its environmental control facilities.
2. The reliability of crop increases under greenhouse cultivation.
3. Ideally suited for vegetables and flower crops.
4. Year round production of floricultural crops.
5. The off-season production of vegetable and fruit crops.
6. Disease-free and genetically superior transplants that can be produced continuously.
7. Efficient utilization of chemicals, pesticides to control pest and diseases.
8. The water requirement of crops very limited and easy to control.
9. Maintenance of stock plants, cultivating grafted plant-lets and micro
10. Hardening of tissue cultured plants
11. Production of quality produce free of blemishes.



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12. It is most useful in monitoring and controlling the instability of various ecological systems.

13. Modern techniques of Hydroponic (Soil less culture); aeroponic are Nutrient film techniques are possible only under greenhouse cultivation.

A SCOPE ON GREENHOUSES AROUND THE WORLD

There are more than 55 countries now in the world where cultivation of crops is undertaken on a commercial scale under cover and it is continuously growing at a fast rate internationally.

The **United States of America** has a total area of about **15,000 ha** under greenhouses mostly used for floriculture with a turnover of more than 3.4 billion US \$ per annum and the area under greenhouses is expected to go up considerably, if the cost of transportation of vegetables from neighboring countries continues to rise.

Spain has been estimated to be around **28,000 ha** and Italy **19,500 ha** used mostly for growing vegetable crops like watermelon, capsicum, strawberries, beans, cucumbers and tomatoes. In Spain simple tunnel type greenhouses are generally used without any elaborate environmental control equipments mostly using UV stabilized polyethylene film as cladding material.

In **Canada** the greenhouse industry caters both to the flower and off-season vegetable markets. The main vegetable crops grown in Canadian greenhouses are tomato, cucumbers and capsicum. Hydroponically grown greenhouse vegetables in Canada find greater preference with the consumers and could be priced as much as twice the regular greenhouse produce.

The **Netherlands** is the traditional exporter of greenhouse grown flowers and vegetables all over the world. With about **89,600 ha** under cover, the Dutch greenhouse industry is probably the most advanced in the world. Dutch greenhouse industry however relies heavily on glass framed greenhouses, in order to cope up with very cloudy conditions prevalent all the year round. A very strong research and development component has kept the Dutch industry in the forefront.

The development of greenhouses in **Gulf countries** is primarily due to the extremity in the prevailing climatic conditions. Israel is the largest exporter of cut flowers and has wide range of crops under greenhouses (**18,000 ha**) and **Turkey** has an area of **12,000 ha** under cover for cultivation of cut flowers and vegetables.

In **Saudi Arabia** cucumbers and tomatoes are the most important crops contributing more than 94% of the total production. The most common cooling method employed in these areas is evaporative cooling.

Egypt has about **1400 ha** greenhouses consisting mainly of plastic covered tunnel type structures. Arrangements for natural ventilation are made for regulation of temperature and humidity conditions. The main crops grown in these greenhouses are tomatoes, cucumbers, peppers, melons and nursery plant material.

In **Asia, China** and **Japan** are the largest users of greenhouses. The development of greenhouse technology in China has been faster than in any other country in the world. With a modest beginning in late seventies, the area under greenhouses in China has increased to **51,000 ha**. Out of this **11,000 ha** is under fruits like grapes, cherry, Japanese persimmon, fig, loquat, lemon and mango. The majority of greenhouses



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use local materials for the frame and flexible plastic films for glazing. Most of the greenhouses in China are reported to be unheated and the use of straw mats to improve the heat retention characteristics.

Japan has more than **40,000 ha** under greenhouse cultivation of which nearly **7500 ha** is devoted to only fruit orchards. Greenhouses in Japan are used to grow a wide range of vegetable and flowers with a considerable share of vegetable demand being met from greenhouse production.

Even a country like **South Korea** has more than **21,000 ha** under greenhouse for the production of flowers and fruits.

Thus, greenhouses permit crop production in areas where winters are severe and extremely cold such as **Canada** and **Russia**. It also permits production in areas where summers are extremely intolerable as in **Israel, United Arab Emirates, Kuwait**.

In the **Philippines** greenhouses make it possible to grow crops despite excessive rains. Thus in essence greenhouse cultivation is being practiced and possible in all type of climatic conditions.

India While greenhouses have existed for more than one and a half centuries in various parts of the world, in India the use of greenhouse technology started only during 1980's and it was mainly used for research activities. This may be because the emphasis had been on achieving self-sufficiency in food grain production. However, in recent years in view of the globalization of international markets and shortages of food a tremendous boost is given to exportation of agricultural produce in India, this has now created a spurt in the demand for greenhouse technology. If India has to emerge as an economic power in the world, their agricultural productivity should equal those countries, which are currently rated as economic power of the world. The greenhouse system may be one key element to sustain food in their growing population/economy.

Finally the **Dominican Republic** The country shores its footers as a power in organic and non-traditional farm crops, with exports of more than US\$300 million per year and more than 30,000 direct and indirect jobs. Among the products are bananas, coffee, cacao, mangoes, Chinese and greenhouses vegetables, lemons, oranges and sapodilla, according to Agriculture Ministry and Dominican Republic Export and Investment Center figures. They note that organic exports, which earned US\$175 million in 2008, surpass US\$200 million this year in 2009. Almost 20,000 hectares are set aside for organic and non-traditional products. The Dominican Republic continues to predominantly grow at a fast rate in tourism sector and food industry with greenhouse technology with the help of countries such as Spain Portugal and Brazil providing support in greenhouse technology.

Sincerely,
ST. BENEDICT BISCOP BENEDICTINE CORPORATION