PROTECTED AGRICULTURE IN BELIZE.

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INTRODUCTION

- The problems of drought, and periods of heavy rain, are the results of climate change.
- The Government of Belize through the ministry of agriculture and Fisheries are making some immediate actions.
- One of the major projects is the installation of 15 Tropical green houses in different areas of the country.
- Protected agriculture is relatively new in the Belizean agriculture scene.
- The primary objective is the identification of an alternative production system that reduces cost of production and minimize dependence on harmful pesticide.
- Farmers from the beginning of time have always strived to protect their crops from pest, disease and unfavorable climatic conditions.

Objective

- To identify covered structures that can be used in Belize to improve the production of traditional vegetables.

TYPES OF STRUCTURES USED IN BELIZE

- Tropical Green House
- Tunnel
- Bubble House
- Plastic Covered Structures

Tropical Green House

- Dimension is 16m x 25m x 7m
- Capacity is approximately 750 plants (tomato or sweet pepper).
- Estimated cost in U.S. dollar is approximately 14,000 (includes frames, cover material, installation, irrigation etc).
- Feature: This new design which is imported includes balconies that allows farmers to produce an alternative crop. The height of the structure create exceptional head space for air circulation and plant growth.

TROPICAL GREEN HOUSE

GIACOMO
VARGAS
DOUBLE UP

Tropical Green House- ADVANTAGES

- Minimal use of pesticides.
- Harvesting calendar is long.
- It protects the crop from rain.
- The material used to cover the structure can last up to 5 years if properly managed.
- In case of an eminent hurricane, the plastic and the mesh can be removed. The structure can resist strong winds.
- It has two balconies that can be used to plant another crop. (cilantro, cabbage, others)

Continued

- Its height and its air vent allows some heat to come out of the structure.
- The farmer can assure the provision of fresh products to hotels and local market when the offer from open fields results in extreme limitation.
- The netting material used on the sides of this type of structure is anti viral which does not allow insects to pass through and cause damage to the crop.

Tropical Green House- DISADVANTAGES

- Initial capital investment is very high.
- The structure can not be moved to another place.
- All the material needed is imported, making it more difficult to purchase.
- Plants tend to grow more and this cause them to be weak and break easily during the management activities.
- This technology is new to the Belizean Agriculture, therefore more research is needed.
- During the hot months the pollination process can be affected, thus affecting the yields.

Tunnel Structure

- Dimension 5m x 30m x 3.5m
- Capacity is approximately 400 plants. (cabbage, sweet pepper or Tomato)
- Estimated cost: U.S. $ 1,250.00 (includes posts, pipes, cover material, labor, irrigation etc)
- Feature: This type of structure is relatively more affordable and easier to assemble than other types. Used mainly for the production of cabbage, but sometimes farmers plant tomato or sweet pepper also.

Tunnel Structure- ADVANTAGES

- Relatively cheap making it affordable by low income farmers.
- Protects the crops from must insect that cause damage.
- Most of the material needed for the construction are easy to access by the farmer.
- Minimal use of pesticides.
- The quality of the product that is harvested is good.

Tunnel Structure- DISADVANTAGES

- The material used (Agryl) doesn't last more than two years. It is easy to deteriorate.
- Creates to much heat due to its height (only 10 feet high and it does not have an air vent).
- The harvesting calendar is not long when compared to the tropical green house.
- It does not protect the crop from rain. The material used is not water proof.
- Strong winds can tear the protective material.
- Does not have balconies compared to the tropical green house.
- During the hot months the pollination process can be affected, thus affecting the yields.

Bubble House

- Dimension: 7m x 13m x 4m
- Capacity: Approximately 220 plants.
- Estimated cost: U.S $ 1,600.00 (includes lumber, cover material, irrigation, labor etc)
- Feature: A local modification of the tropical greenhouse constructed from bush posts, lumber and PVC pipes in an effort to reduce cost.

Bubble House- ADVANTAGES

- Relatively cheap.
- The incidence of insects pests is minimal because the netting material used on the sides of this type of structure is anti viral which does not allow insects to pass through and cause damage to the crop.
- Minimal use of insecticides.
- Good quality product is obtained.
- The harvesting calendar is longer compared to crops that are planted in the opened fields.
- The material used for the roof is water proof, meaning that the crop is protected from rain.

Bubble House- DISADVANTAGES

- Proper management to avoid the introduction of pest and disease is required.
- Creates a lot of heat during the hot months.
- The harvesting calendar is not long compared to the tropical green house.
- Plants tend to grow more in response to sunlight.
- During the hot months the pollination process can be affected, thus affecting the yields.
- The planting area is reduced.

Plastic Covered Structure

- Dimension 13m x 20m x 4m
- Capacity is approximately 450 plants
- Estimated cost: U.S. $ 900.00 (includes lumber, cover material, labor, irrigation etc)
- Feature: The primary benefit of this structure is to reduce the negative impact such as increase incidence of pest and disease damage caused by periods of high rainfall. There is no use of anti-viral netting so issues of high internal temperatures and cost of material is eliminated.

Plastic Covered Structure- ADVANTAGES

- The construction of the structure is cheap because the material used with the exception of the plastic is easy to access by the farmer.
- Protects the crop from heavy rains.
- The internal temperature is not a problem.
- Small machinery can be used easily when needed.
- The structure can be removed if needed.

Plastic Covered Structure- DISADVANTAGES

- Does not protect the crops from insect attack.
- Farmers need to monitor frequently for insects.
- The use of pesticides is a need.
- The quality of the product might be affected by insects.
- The posts and other construction material that are used comes from the forest, meaning that the duration of this type of structure is not more than three years.

Conclusions

- Protected agriculture in Belize is becoming important.
- Farmers are satisfied with the yields obtained with the use of covered structure.
- The tropical green house is giving better results than the others structures.

Recommendation

- Research needs to be carried out to facilitate farmers with information.

THANKS