

The Effects of Global Climatic Variations on Fruits Industry in Taiwan and Strategies for Adaptation

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Abstract

Climatic variations are important for agricultural development, stability of society and prosperity of a country. Temperature, precipitation, sunlight, CO₂ and air pollution are some important factors of climatic variations which may result in low productivity and quality of crops, livestock and marine products. Eco-system may also be changed by such climatic variations and cause the extinction of some endangered plant and animal species. Typhoon, flood, chilliness, drought, hail and earthquake were some severe natural disaster in Taiwan in current decade. The disadvantages of climatic variation on fruit industry include : 1. Decline of photosynthesis, transpiration, carbohydrate accumulation, total soluble solid content and coloration of fruit; 2. Disorder of nutrient and water absorption, flower bud differentiation, dormancy, water metabolism, pollination and fruit set ; 3. Retard of plant growth and development; 4. Toxic plants and collapse of orchard. Only few advantages for fruit trees while climate changed.

Some approaches for adaptation of such impact caused by climatic variation are suggested as follow: 1. Development of new varieties which are tolerant or resistant to heat, flood, drought, disease and pests, early or late maturity, and low chilling requirement; 2. Physiological researches focus on flower bud differentiation, enhancement of photosynthesis by high CO₂ concentration, effect of air pollution and the prevention or improvement of such pollution; 3. Development of new technology for orchard management, such as methods of dormancy break, regulation of harvest season, prevention of heavy rain under structure, irrigation and drainage, and artificial lighting; 4. Choice of orchard location based on better light, air cleanness, irrigation, drainage and soil conservation; 5. Study and development on

new covering material of greenhouse for better transparency of sun light; 6. Improving the precision of climate prediction; 7. Amendment of law or regulation on environmental protection, and establishing prevention and recovery system for natural disaster; 8. Encouragement and extension of organic farming, reducing the application of chemicals. Hopefully, the environment can be protected properly, and natural resources may maintain sustainable utilization via these approaches in the future.

Key words: Climatic variation, Fruit crops, Productivity, Quality, Adaptive strategy