



Agriculture & Biosecurity

WHAT IS BIOSECURITY?

Biosecurity is a strategic and integrated approach that encompasses the policy and regulatory frameworks (including instruments and activities) for analyzing and managing relevant risks to plant life and health, and associated risks to the environment.

Biosecurity specifically addresses plant diseases and pests, the introduction and release of living modified organisms (LMOs) and their products and the introduction and management of invasive alien species. Thus biosecurity is a holistic concept of direct relevance to the sustainability of agriculture, and wide-ranging aspects of public health and protection of the environment, including biological diversity.

The overarching goal of biosecurity is to prevent, control and/or manage risks to life and health as appropriate to the particular biosecurity for plants grown indoors. In doing so, biosecurity is an essential element of sustainable agricultural development.

This is a strategic and integrated approach to biosecurity as a holistic concept that is of direct relevance in meeting consumer expectations in relation to the safety of their medicine being cultivated.

THE CONTEXT OF MODERN BIOSECURITY

Biosecurity issues have an ever-increasing profile on a global basis due to a range of factors. The increasing diversity and volume of materials needed to cultivate plants and their products is a key contributor in the spread of recognized diseases from region to region.

Changing agricultural practices are resulting in new hazards to health that are readily able to cross borders. Changing human ecology and behavior also contribute to the greater incidence and spread of hazards of public, and plant health importance. New technologies add a further dimension, for instance organisms and products derived from biotechnology need to be evaluated for any potential risks to health.

With increasing public awareness of the impact of adverse biosecurity events and interventions, political and social demands on government regulatory agencies are resulting in considerable infrastructural change. Stakeholder interest is fueled by technological advances in detection and management of hazards to life and health, together with the often unresolved scientific debate that surrounds the potential of very low levels of hazards to result in adverse health or environmental impacts.

In a modern biosecurity environment, considerable importance is placed on a holistic approach. Countries are encouraged to base their controls, as far as possible, on international standards where they exist. Harmonization at the national level can occur in terms of generic approaches to biosecurity and/or in terms of biosecurity standards themselves. At the national level and internationally, there are likely to be significant benefits in integrating biosecurity activities to the extent practical.



THE IMPORTANCE OF BIO-SECURITY IN CANNABIS CULTIVATION

Plant life and health and protection of the environment are inextricably linked and this is the fundamental rationale for an integrated approach to biosecurity at the cultivation facility. Biosecurity hazards of various types exist in each sector and have high potential to move between sectors (e.g. many animal pathogens readily infect humans; animal feed may be contaminated with mycotoxins and plant toxins). While transfer of pests of plants between biosecurity sectors occurs, inadequate control can have impacts well beyond plant health.

Cultivation hazards can be introduced anywhere along the process of cultivation to consumption and a breakdown in security at any point can result in adverse health consequences to the plants and humans in multiple biosecurity sectors. As examples, pesticide residues in plant cultivation are one example of the immense potential for biosecurity hazards to move between and within an indoor cultivation facility.

Changes in the environment, such as the loss of biological diversity and contamination of nutrients and water sources, sometimes result in significant risks to the cannabis plant and essentially the end user, human health. It has been reported that 90 percent of all preventable plant diseases are due to the deterioration of the environment, and the principal causes of these diseases include a lack of sanitary measures, contamination of water sources and unsafe environmental practices.

RISK MANAGEMENT

Many aspects of a risk-based approach to biosecurity are shared by the different sectors concerned and this provides an essential impetus to risk analysis as a unifying discipline in biosecurity. Risk analysis is composed of three distinct but closely connected components – risk assessment, risk management and risk communication – which are explained in detail.

International standard-setting organizations and bodies involved with different components of biosecurity have embraced risk assessment as an essential tool to achieve their goals. Biosecurity risk assessment involves a scientific process to estimate risks to life and health of the environment and that may be associated with the cannabis plant or specific organism. Prevention, reduction or elimination of those risks can take many forms. Biosecurity systems were not necessarily based on robust and transparent scientific inputs to standard-setting processes, especially those for pharmaceutical cannabis cultivation. Now, the importance of good science and risk assessment to biosecurity cannot be overemphasized and this places considerable technical demands on the cultivation process.

Biosecurity risk management incorporates considerably different processes to risk assessment. Core decisions involve the balancing of scientific findings against questions of life and health expectations and the technical feasibility and cost-effectiveness of controls. The merging of policies and values with science in biosecurity risk management presents considerable challenges and **iGROWMD** has bridged this gap.

Both risk assessment and risk management should be wrapped in a “sea of communication” that includes all aspects of the cultivation process. Successful risk communication is a prerequisite for effective risk assessment and risk management, and facilitates the iterative and ongoing nature of risk analysis. This can be accomplished with advanced controls supplied by **the iGROW365 Environmental Control Center**, which monitors all inputs to the successful cultivation of the cannabis plant.



CANNABIS PLANT HEALTH

Application of regulatory controls to protect plant health is an important biosecurity domain. Plant health can be adversely affected by different types of pests (i.e. plants themselves, and animals or pathogenic organisms which are injurious to the cannabis plants or plant products). Management of pathways and vectors is an important aspect of plant health biosecurity.

Establishment and spread of a pest often depends directly on biological factors such as availability of suitable plant hosts and vectors, crop cultivation practices, suitability of the environment and natural enemies. As with animal health biosecurity, adverse plant health impacts are usually evaluated in direct economic terms.

Approaches to plant health biosecurity are undergoing changes similar to those in other biosecurity sectors like the pharmaceutical industry and clean rooms in hospitals. With an increasing interest in environmental issues, competent authorities responsible for plant health must also manage environmental pests that primarily affect other organisms, thereby causing harmful effects on plants and plant ecosystems. Organisms produced by modern biotechnology also may threaten the plant environment such as by out-crossing to create more aggressive pests or wild relatives that upset the ecological balance and decrease biodiversity.

While competent authorities can be proactive in preventing import of pests, risk management programmers are needed to control pests that have become established within the interior of a cultivation facility. As with animal health, “pest-free” geographical compartments can be established within countries or regions so that plants and their products can continue to be traded.

iGROW365/MD ESTABLISHES BIO-SECURITY THROUGH CONTROL

Establishing biosecurity controls and ensuring their implementation is the core responsibility of competent authorities. They should have appropriate policies and regulations in place, as well as operational principles, procedures and capacity, and adequate resources. They should have, or have access to, adequate technical and scientific knowledge and skills, and should have adequate infrastructure.

Implementing agricultural biosecurity mandates demands systems be set and resources be allocated with adequate technical capability. This includes personnel with specialized scientific knowledge and skills to carry out biosecurity functions (e.g. advice, inspection, verification and enforcement, diagnostic analysis, quarantine and certification, risk profiling and priority setting, standard setting and implementation, monitoring and surveillance, and emergency preparedness and response), based on a risk analysis approach wherever possible and practical.

Emergency preparedness and response in the event of a disease outbreak are key elements of biosecurity systems and need for this capability is illustrated by recent disease outbreaks in many current cannabis cultivation facilities.

CONCLUSION

Improved health and well-being the cannabis plant and the medicine that comes from it are the ultimate outcomes of well-functioning biosecurity systems. These outcomes are strongly influenced by the environment and, in this context; agriculture and health are linked in many ways. Agriculture produces medicine from plants and is an important source of health and livelihoods. At the same time, agriculture can lead to poor health, especially in the form of infectious disease and sickness from pesticide consumption.

The benefits of a more harmonized and integrated approach to biosecurity are already apparent in most agricultural situations. While the multi-sectoral character of biosecurity and the diverse range of interests involved make each situation different, there are likely to be significant improvements in biosecurity systems and outputs if more coherent national and international approaches are applied. Benefits include improved regulatory and policy frameworks for improved plant health, greater efficiencies in the use of human and financial resources, better understanding of potential risks (within and between sectors) and appropriate measures to manage them, and improved protection and sustainable use of the environment. Moreover, a more holistic approach to biosecurity will enable these benefits to be achieved in a manner that avoids inconsistencies, fills gaps, and prevents issues with producing high quality agricultural crop production.

iGROW365/MD is leading the bio-security movement by designing and implementing standard operating procedures for both indoor and greenhouse cannabis cultivation. iGROW365/MD supplies the designs, equipment and controls to allow for fully integrated systems that create positive pressure environments allowing cultivators to stop using pesticides on their crops. The cannabis industry should hold itself to the standards of traditional pharmaceutical companies and follow the procedures that have been set forth to assure that every form of medicine that comes out of their facilities is clean and exactly the same as in the past.





