

Advice for farmers growing new or unfamiliar crops

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Farmers often experiment with new crops, believing that the crops may hold economic potential for their operations. When people grow new crops, they invariably encounter unfamiliar problems. However, there are steps one can take to meet these challenges and emerge successfully.

1. Anticipate threats.

Plant diseases occur at virtually every modern farm or cultivation site in Hawaii. Some diseases pose great threats to growth or yield and occur regularly on certain crops grown in specific locations. For example, powdery mildew occurs yearly on mango in the Kona region of the Big Island, having a significant, negative effect upon mango fruit production. Knowing which diseases are likely to occur can enable a grower to prepare and manage problems effectively.

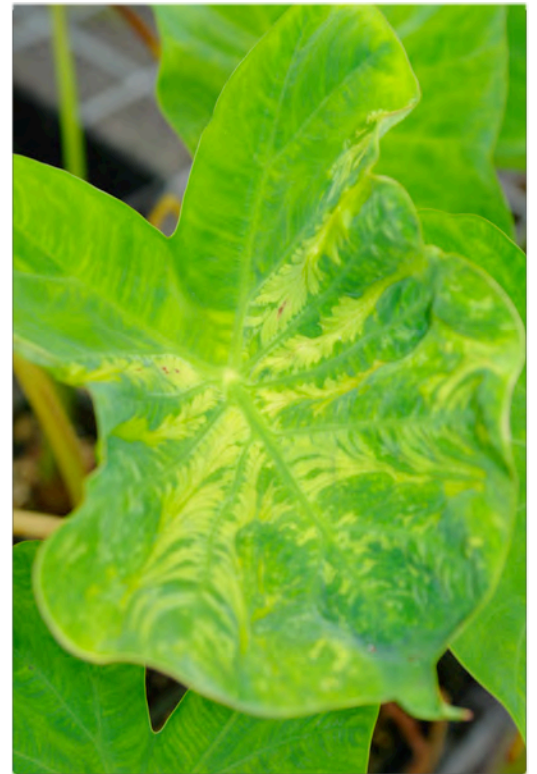
First, a farmer growing a crop or plant species for the first time should understand his cropping environment and the effects it will likely have on plant health. The likelihood that a given plant disease will occur depends on a number of factors, including the crops grown, rainfall patterns, relative humidity, soil type, site elevation, cropping history of the site, winds, air temperature, cropping systems (monocropping, polycropping, agroforestry), health of transplants and other factors.

Then, the farmer should discover which diseases pose important threats to the crops and how one can prevent and manage the diseases. This information is available through the University of Hawaii's Cooperative Extension Service or on the Internet. For example, visit [The Plant Doctor](#) website and download the list of [Top Crops, Top Diseases](#) in Hawaii. Photographic images of typical disease symptoms are available online for many crops grown in Hawaii at the [Plant Disease Disease Image Galleries](#).

A farmer enabled with this information will be prepared to identify diseases as they occur and will be ready with effective disease management products and practices. Such materials and practices are described in many free [articles](#) or by contacting me at snelson@hawaii.edu.

2. Prevent important problems.

I have seen 20-acre noni farms on the Big Island abandoned due to infection by root-knot nematodes. Such a tremendous waste of time and money was avoidable. The



New taro farmers should understand that dasheen mosaic disease does not pose a large threat to most of the taro varieties grown in Hawaii, but can damage some varieties significantly.

farmers transplanted noni seedlings that were infected by nematodes in a nursery. The nursery manager failed to use sterile growth media. Rather, he used nematode-infested soil to grow the seedlings. If the nursery manager had simply followed our advice to use sterilized media, the 20-acre farms would not have been abandoned due to the sick and dying plants. And, if the noni farmers using the fields had simply inspected the roots of the seedlings before planting for root galls, they would have recognized the disease and could have avoided using the seedlings. When you consider that the productive life for a well-managed orchard crop such as coffee or noni is at probably 50 years at least, it makes great sense to use care and preventive practices in seedling preparation and planting.

Similar mistakes occur commonly in many different types of farming or plant cultivation systems in Hawaii. A farmer or nursery manager may think it is wise to cut corners, to save costs in certain initial phases of operation, while unaware that the costs associated with managing some plant pathogens and diseases *far* exceed the costs of preventing them. Please use careful consideration and informed decision making, as it may be the only way a farmer will be able to stay in business.

3. Diagnose problems correctly.

Getting a timely and accurate diagnosis for a disease is critical to its effective management. A wrong diagnosis can cause a farmer to apply inadequate or incorrect products and practices, which wastes time and money and threatens the crop through the delayed application of the correct procedures.

In some cases, using wrong disease management practices can cause more harm than good. For example, a root rot disease can cause plant foliage to turn yellow and be misdiagnosed as a simple fertilizer deficiency. To apply more fertilizer as a treatment, however, could worsen the root rot. Instead, one would actually need to apply correct management practices affecting soil moisture or protecting roots from infection.

A farmer should know how to collect and submit plant tissue samples for problem diagnosis (<http://www.ctahr.hawaii.edu/oc/freepubs/pdf/SCM-14.pdf>). Growers may also submit symptom photographs and information to me by e-mail for rapid diagnosis and effective management procedures. This can save critical time for quickly developing diseases such as late blight of tomato, for which a few days of delayed disease management could mean nearly complete crop failure.

4. Manage diseases promptly.

One mistake I see frequently is that farmers wait too long to begin disease management. Please do not underestimate the potential for microorganisms to ruin a crop or severely limit the yields. Once a disease has been correctly diagnosed, disease management practices should begin early in the disease cycle. If an important disease can be identified early in its disease cycle, management of the disease will be much more effective and less costly. There will be less diseased tissue to manage and the pathogen population size will be smaller. Labor and product costs will be minimized.



Management of important fungal diseases such as black spot of rose should begin as soon as symptoms appear. Delayed action can result in extensive defoliation.

Many plant diseases eventually progress exponentially - very rapidly - within plant populations, producing a typical S-shaped curve when we plot disease progress (y-axis) against time (x-axis). The key to managing these diseases is to act before the curve turns upward and before disease increase reaches the exponential phase.

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