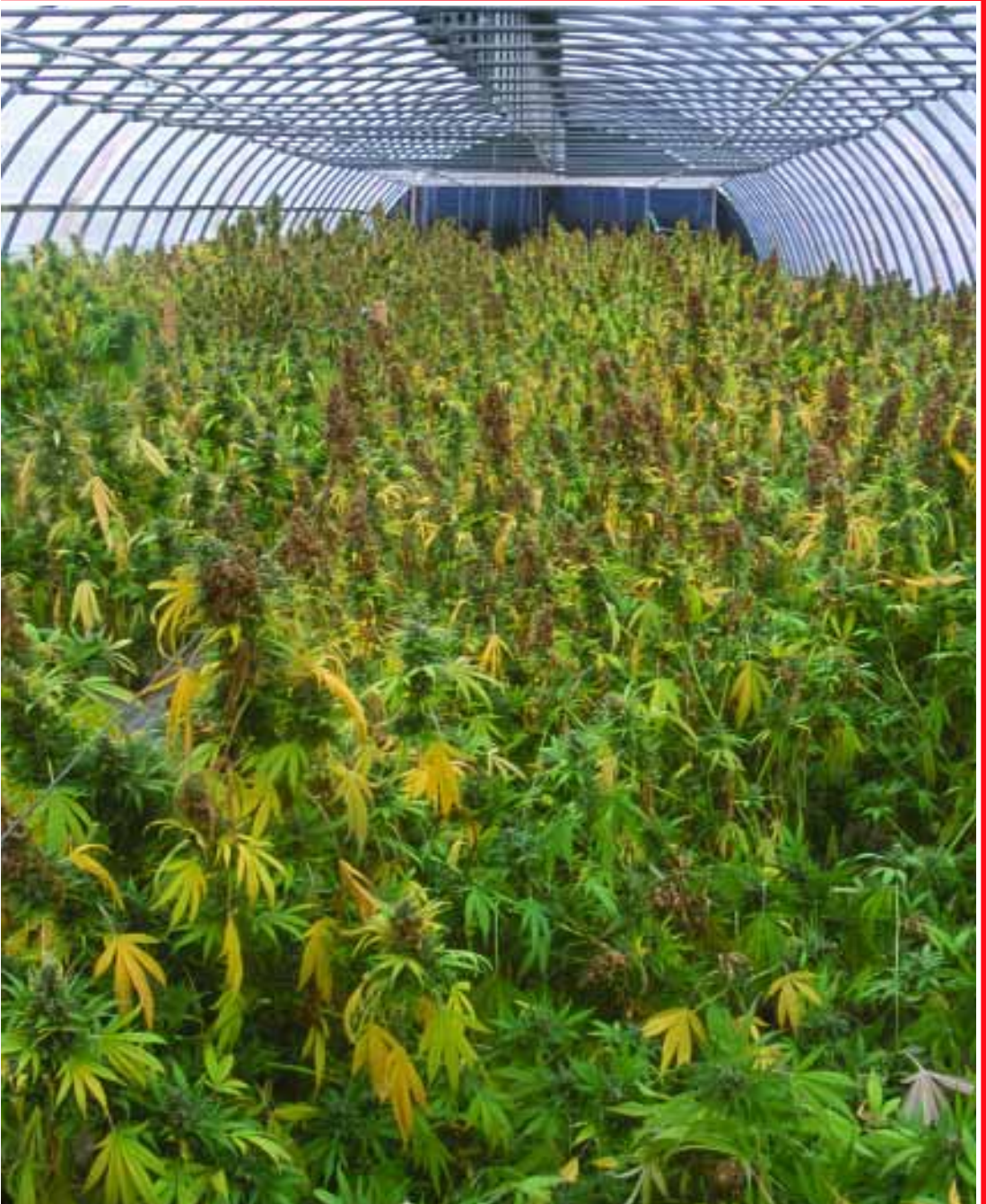


Chapter FOURTEEN PESTS, FUNGI & DISEASES



This beautiful greenhouse crop was destroyed by botrytis.



Simple hygiene in the grow room keeps pests and diseases in check.



Dirty grow rooms help cause pest and disease problems.



Sweep the grow room floor every few days to avoid problems with pests and diseases.

Introduction

Insects, mites, and maggots slither into grow rooms eating, reproducing, and wasting weed. Outdoors, they live everywhere they can. Indoors, they live anywhere you let them. Fungi are present in the air at all times. They may be introduced by an infected plant or from air containing fungus spores. Fungi will settle down and grow if climatic conditions are right. Pests, fungi, and diseases can be prevented, but if allowed to grow unchecked, extreme control measures are often necessary to eradicate them.

Prevention

Cleanliness is the key to insect and fungus prevention. The grow room should be totally enclosed so the environment can be controlled easily. Keep the floor clean. Keep all debris off soil surface. Do not use mulch. Insects and fungi like nice hideaway homes found in dirty, dank corners, and under dead decaying leaves or rotting mulch. Growers and their tools often transport many microscopic pests, diseases, and fungi that could ultimately destroy the garden. This does not mean growers and their tools have to be hospital clean every time they enter a grow room, even though that would be nice. It does mean normal and regular sanitary precautions must be taken. Growers who wear clean clothes and use clean tools reduce problems considerably. A separate set of indoor tools is easy to keep clean. Pests, diseases, and fungi habitually ride from plant to plant on dirty tools. Disinfect tools by dipping in rubbing alcohol or washing with soap and hot water after using them on each diseased plant. Another quick way to sterilize pruners is with a hand-held torch. A quick heating with the torch will sterilize metal tools immediately.

Personal cleanliness is fundamental to preventing pests and diseases. Wash your hands before touching foliage and after handling diseased plants. Smart growers do not walk around the buggy outdoor garden and then visit the indoor garden. They do it vice versa. Think before entering the indoor garden and possibly contaminating it. Did you walk across a lawn covered with rust fungi or pet the dog that just came in from the garden outside? Did you just fondle your spider mite-infested split-leaf philodendron in the living room? Avoid such problems by washing your hands, and changing shirt, pants, and shoes

before entering an indoor garden.

Once a crop has been grown in potting soil or soilless mix, throw out the grow medium. Some growers brag about using the same old potting soil over and over, unaware that this savings is repaid with a diminished harvest. Used soil may harbor harmful pests and diseases that have developed immunity to sprays. Starting a new crop in new potting soil will cost more up front but will eliminate many potential problems. Used soil makes excellent outdoor garden soil.

Be careful when discarding used soil! Growers in Eugene, Oregon, tossed their outdoor soil out in the backyard for many years. The soil was about 50 percent white perlite and had a distinctive color. This oversight eventually led to the growers' arrest.

Once potting soil is used, it loses much of the fluff in the texture, and compaction becomes a problem. Roots penetrate compacted soil slowly, and there is little room for oxygen, which restricts nutrient uptake. Used potting soil is depleted of nutrients. A plant with a slow start is a perfect target for disease, and worst of all, it will yield less!

Companion planting helps discourage insects outdoors. Pests have nowhere to go indoors, so companion planting is not viable in the grow rooms.

Plant insect- and fungus-resistant strains of marijuana. If buying seeds from one of the many seed companies, always check for disease resistance. In general, *Cannabis indica* is the most resistant to pests, and *sativa* is more resistant to fungal attacks. Choose mother plants that you know are resistant to pests and diseases.

Keep plants healthy and growing fast at all times. Disease attacks sick plants first. Strong plants tend to grow faster than pests and diseases can spread.

Forced air circulation makes life miserable for pests and diseases. Pests hate wind because holding on to plants is difficult, and flight paths are haphazard. Fungal spores have little time to settle in a breeze and grow poorly on wind-dried soil, stems, and leaves.

Ventilation changes the humidity of a room quickly. In fact, a vent fan attached to a humidistat is often the most effective form of humidity control. Mold was a big problem in one of the grow rooms that I visited. The room did not have a vent fan. Upon entering the enclosed room, the



Healthy plants are easy to keep strong and are able to fight off pests and diseases.

humid air was overpowering. It was terrible! The environment was so humid that roots grew from plant stems. The grower installed a vent fan to suck out moist, stale air. The humidity dropped from nearly 100 percent to around 50 percent. The mold problem disappeared, and harvest volume increased.

Indoor horticulturists who practice all the preventative measures have fewer problems with pests and diseases. It is much easier to prevent the start of a disease than it is to wipe out an infestation. If pests and diseases are left unchecked, they can devastate the garden in a few short weeks.

Control

Sometimes, even when all preventative measures are taken, pests and diseases still slink in and set up housekeeping. First, they establish a base on a weak, susceptible plant. Once set up, they launch an all-out assault on the rest of the garden. They move out in all directions from the infested base, taking over more and more space, until they have conquered the entire garden. An infestation can happen in a matter of days. Most insects lay thousands of eggs in short periods of time. These eggs hatch and grow into mature adults within a few weeks. For example, if 100 microscopic munchers each laid 1000 eggs during their two weeks of life and these eggs grew into adults, two weeks later 100,000 young adults would lay 100 eggs each. By the end of the month, there would be 100,000,000 pests attack-

Logical Progression of Insect Control

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|-----------------------------|----------------------|
| 1. Prevention | 2. Manual Removal |
| a. Cleanliness | a. fingers |
| b. Use new soil | b. sponge |
| c. One indoor set of tools | |
| d. Disease-resistant plants | 3. Organic Sprays |
| e. Healthy plants | |
| f. Climate control | 4. Natural Predators |
| g. No animals | |
| h. Companion planting | 5. Chemicals |



Manually remove small populations of pests by smashing pests and eggs between your fingers. Make sure to wash your hands afterward.



A 30X battery-powered magnifying scope makes insects and diseases easier to identify.

ing the infested garden. Imagine how many there would be in another two weeks!

Sprays often kill adults only. In general, sprays should be applied soon after eggs hatch so young adults are caught in their weakest stage of life. Very lightweight (low viscosity) horticultural oil spray works well alone or as an additive to help kill larvae and eggs.

The availability of some sprays can be seasonal, especially in more rural areas. Garden sections of stores are changed for the winter, but extra stock is sometimes kept in a storage room. Look for bargains on sprays at season-end sales. Today, there are many indoor grow stores that carry pest and disease controls all year round.

Insect Control

Indoor gardeners have many options to control insects and fungi. Prevention and cleanliness are at the top of the control list. A logical progression to pest and disease control is outlined in the chart on this page. (Note that it begins with cleanliness!)

Manual removal is just what the name implies –smashing all pests and their eggs in sight between the thumb and forefinger or between two sponges.

I like natural-organic sprays such as pyrethrum and neem and use harsh chemicals only as a last resort. Any spray, no matter how benign, always seems to slow plant growth a little. Stomata become clogged when foliage is sprayed and covered with a filmy residue. Stomata stay



Yellow sticky traps are used to monitor pest populations as well as to control small flying insects.