Weed and pest control in nursery production and their impact on plant quality

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Woody plants can be attacked by many pathogens in the first, second and third growing seasons in the nursery. Different biological and chemical methods for control have been developed in the past to achieve the production of good quality plants to meet the demands of the customer.

WEED CONTROL

Mechanical and chemical weed control in nursery production have had a great impact on plant development and quality. Weeds and the nursery crop arc in competition for nutrients, water and sunlight. To achieve good weed control from the beginning several mechanical weeders have been developed over recent years but their use in nurseries is limited to those situated on sandy, stone-free and free draining soils.

On seed beds, fumigation with Basamid Granulat (Dazomet) or other soil fumigants is still frequently used in nurseries. Steaming is an alternative to this practice but it is expensive and difficult to carry out in an open nursery.

A number of soil active herbicides are used for treating transplants, such as Afalon (Linuron), Butisan (Metazachlor), Galery (Isoxaben), Stomp (Pendimethalin) and Venzar (Lenacil). Other products with contact action such as DowShield (Clopyralid), Gramoxone (Paraquat) and Roundup (Glyphosate) are also used during the season.

Herbicide use is an important consideration in the nursery production cycle. Growers need to understand the action and selectivity of each product or combination of products. Damage to nursery crops by incorrect herbicide use is often incurred. It is highly recommended that growers start with a small scale pilot trial at first with any new product. Most herbicides cause specific symptoms on plants when damage occurs.

CONTROL OF FUNGI

Some fungi appear to have a kind of partnership with certain plant species, like powdery mildew *(Microsphaera alphitiodes)* on English oak or rust *(Melampsoridium betulinum)* on birch. They are always found on those plants and need to be managed carefully. Heavily infested plants show growth reduction and sometimes also dieback of the top branches in spring or in cold-storage.

Modern products used in farm production are very effective in controlling these fungi. For example, powdery mildew on oak can be controlled by spraying at 30-day intervals with

Figure Metosulam + Flufenacet damage of oak.

Figure 2: Roundup damage of oak due to application as top dressing in late spring.

Figure 3: Powdery mildew on oak.

Picture 4: Woolly aphid on beech.

products like Fortress (Quinoxyfen) or Collis (Boscalid, Kresoxim-methyl), when treated before a high infestation of the crop occurs.

Other products, such as sulphur which have contact action applied during warm weather combined with the added effect of control of gall mites can be incorporated into the spraying regime.

Rust fungi on birch or alder *(Melampsoridiwn hiratsukanum)* can be treated very effectively with products like Folicur (Tebuconazole) or Bayfidan (Triadimenol). They may have a slight stunting effect on the crop, but often this is more of an advantage than a disadvantage, because plants tend to get too big in most years.

CONTROL OF INSECTS AND OTHERS

Different species of nematode can cause severe stunting in forest nursery crops such as cherry *(Prunus avium)* and beech *(Fagus sylvatica)* in fields which have been in nursery production for a long time. It is mainly *Pratylenchus* nematodes that cause the problem. Control is possible with fumigation or using products like Temik (Aldicarb). Biological control is also possible by growing *Tagetes* spp. for a growing season.

Some forest species like ash *(Fraxinus excelsior)* can suffer from gall mites (Aculus *epiphyllus).* The leaves turn brown on the underside and the plants show growth reduction. Most growers do not recognise the infection, because the gall mite is much smaller than the spider mite. Control is possible using any of the products that are used against spider mites.

Woolly aphids *(Phyllaphis fagi)* on beech seem to be the most difficult insect to control at the moment. The insects have increasingly developed resistance to products such as Admire (Imidacloprid). Alternatives (Clothianidin, Thimetoxam) are not yet available or belong to the same chemical group. Young plants of beech *(Fagus sylvatica)* often show extreme dieback after heavy infestation with woolly aphid.

Another example of dieback caused by insects is the gall midge *(Arnoldia quercus)* on oak, especially in the second and third growing season in the nursery when it causes dieback of the very young growth. Good control requires frequent application of Hallmark (lambda-Cyhalothrin) otherwise the plants will need to be hand-trimmed before shipment.

Figure 5: Gall midge damage on oak which has destroyed the leader

SUMMARY

Pest and weed control are very important factors in achieving good plant quality in nursery production. Careful monitoring of both pathogens and weeds is necessary. Knowledge of biological and chemical control methods will give the grower the option of applying different methods of control to achieve the best results.