

## Plant Protection in Danish Nurseries®

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During the last 10 years a great number of changes have taken place within the plant protection sector. Previously the growers viewed plant protection as something one did routinely with chemicals when the crops needed it, i.e., when pests of any sort attacked the crops. Caution was exercised but often uncritically. Sprays were carried out as prophylactic measures and the question of real need for the treatments were not evaluated beforehand.

Today both owners and workers in the nurseries and the consumers who buy the plants produced have become much more cognisant of the use and potential dangers of the chemical plant protection measures. It is undesirable that the chemicals are used uncritically; some even go as far as rejecting chemical plant protection entirely and support movements such as "organic horticulture" or at least reduced usage of dangerous chemicals. Dangerous, taken in its broadest sense, also includes the use of inorganic fertilizers and chemicals that may accumulate in soil or ground water. This is reflected in the view that chemicals must be used as little as possible and with great caution both to protect the worker, environment, and consumer. A great interest and also use have been evident for the alternative (biological) pest-control strategies that have evolved especially for edible crops in greenhouses.

Not only producers' and consumers' views have changed but the regulations by state and EU agencies have tightened and for example have outlawed a number of previously highly used and effective pesticides. The Danish Department of the Environment has been very active in this respect; for example, a comprehensive re-evaluation of all older pesticides was initiated previously during the late 1980s of the last century. All compounds and formulations that were approved before 1985 were to be re-evaluated after renewed application from the manufacturers for approval according to new guidelines. It was demanded that the compounds meet the harsher restrictions of new enacted laws. Many of the older pesticides did not measure up to the restrictions. In cases where the manufacturers of such pesticides did not wish to carry out the required tests and perhaps reformulations just for the small Danish horticulture market, such pesticide formulations were taken off the market. If that did not occur the pesticide would be black listed and prohibited for sale after a set date. It was to a large extent special formulations and pesticides that were designed for small crops and special uses that were subject to this black listing, much to the chagrin of niche crop growers.

The Danish restrictions depart in at least two ways from the rest of the EU restrictions on pesticides. One is on the health and/or environmental influence of a given pesticide; if it is suspected of having any effects on these areas the safety factor has been increased by a factor of 10 which often leads to rejection due to a lack of evidence from previous tests. The second area is with edible crops; here the documentation from the manufacturers have produced test concentration data that should satisfy even the areas with the highest infection pressure can utilize pending approval of the pesticide. But if the pest requires more treatments or higher concentrations under these conditions than under Danish conditions, Danish authorities will not approve the pesticide. That is if the material for approval is researched

and shown to be efficient with seven treatments in an area with 100 times higher infection pressure and the same pest could be effectively eradicated with only three treatments and with half dosage then it will still not be approved in Denmark.

Thus the chemical companies must produce special documentation to satisfy the Danish authorities and this often results in a refusal of applying for approval due to the extra costs this procedure requires. It must be stated, however, that the granting agency has been very obliging towards the "small crops" considering that this area is the hardest hit by the advanced demands. These has been given special attention to limited dispensation approval during transition periods for certain pesticides also a faster bureaucratic procedure has been the case for so-called "off-label" approvals.

In the rest of EU a procedure for fast approval to use a new pesticide called "provisional approval" is in effect. Such approval can be granted when the proper authority in Brussels, Belgium, has received the entire "registration package". The prerequisite being that the country of origin for the pesticide has notarised the material as complete. In Denmark we can at the earliest treat an application for provisional approval when a monograph has been produced which typically takes 1 or 2 years. This often leads to a delay of Danish approval of up to 5 years.

The chemical industry has undergone several changes during the recent period with many global mergers and the joining of companies muddles the picture for agrochemicals. What once was an obvious and traditional field for many smaller national or regional companies to supply a certain sector such as horticulture with specific pesticides now is seen in the larger perspective and it often results in the discontinuation of certain products because of the limited potential for making a high monetary return.

In Europe one of the largest tasks for the chemical companies is the progressing European re-evaluation of agrochemicals where all resources are set in motion to produce and prepare the required information. Deadline for the present round of applications was 1 May 2002. It is expected that of the ca 800 previously approved active ingredients there will only be about 250 that will obtain final approval. The initial approvals are expected to be for compounds useful for the large agricultural crops such as cereals, potatoes, and sugar beets, while the smaller crops will remain without approved compounds for the foreseeable future. It is also expected that the out-phasing (prohibition) of compounds that have not obtained approval or where the producers already previously have given up defending their product all will begin 1 July 2003.

This all means that although the growers of smaller crops have felt that they have been left out when the big guys fight they can only expect further troubles in the coming years. If these growers wish to have any possibility of obtaining the need chemicals they must get together and play an active role in the political/bureaucratic jungle. Cooperation is necessary with the national authorities and representatives for small crops in other countries. The goal must be to press for mutual approvals that is when a pesticide is approved in one EU country it should automatically also be approved in all other countries belonging to the same climate zone. Producers of small crops must cooperate to obtain and finance the necessary documentation in the form of data for concentrations and or affectivity. Data must be publicly available for all parties and there should be mutual applications.

In response to the question about which pesticides we have available presently and in the near future it is in spite of all the problems and difficulties still not completely impossible to buy and use good and not very dangerous chemicals. Regarding the traditional “infant fungal maladies” of many plants such as *Pythium*, *Phytophthora*, *Rhizoctonia*, *Botrytis*, *Oidium*, and *Fusarium* we have a rather good spectrum of effective treatments. Also for insects like thrips, aphids, and sciarids we have good pesticides.

Newer compounds and formulations against fungal diseases belong to the chemical group of strobilurines and two formulations containing these compounds are Amistar® and Candit®; these are approved for horticultural crops. They are very broad-spectrum fungicides with unique spreading properties that insure complete coverage of all plant parts and thus a very good protection even if not all parts of a plant are directly hit by the spray — this is called surface systemic coverage. The two formulations are the first in this group and more are under development. The strobilurines have shown excellent activity towards *Oidium*, *Puccinia*, *Pythium*, *Phytophthora*, and *Peronospora* in addition some effect towards *Botrytis* and *Rhizoctonia*. Another new product is Acrobat® containing the chemical dimetomorph, it is effective towards several obnoxious *Phytophthora* races. Against *Botrytis* have been registered two new products Scala® and Teldor®.

For insect eradication a product called Confidor® should have the best possibilities for use in greenhouses. It is possible with this pesticide to kill all — even the so-called recalcitrant aphids. Latest approval is Conserv® for thrips and leaf miners. Conserv® is produced by fermentation by a natural soil organism the actinomycete *Saccharopolyspora spinosa*. Following fermentation, the active compound spinosad is obtained from a whole broth extraction. The spinosyns were first identified, in a soil sample, in 1982. Commercially introduced during 1997 and it is thus to some extent “biological” and very gentle towards environment, plants, and humans.