

PROTECTED BY
CONNIFLEX

Plant the Planet

01. History

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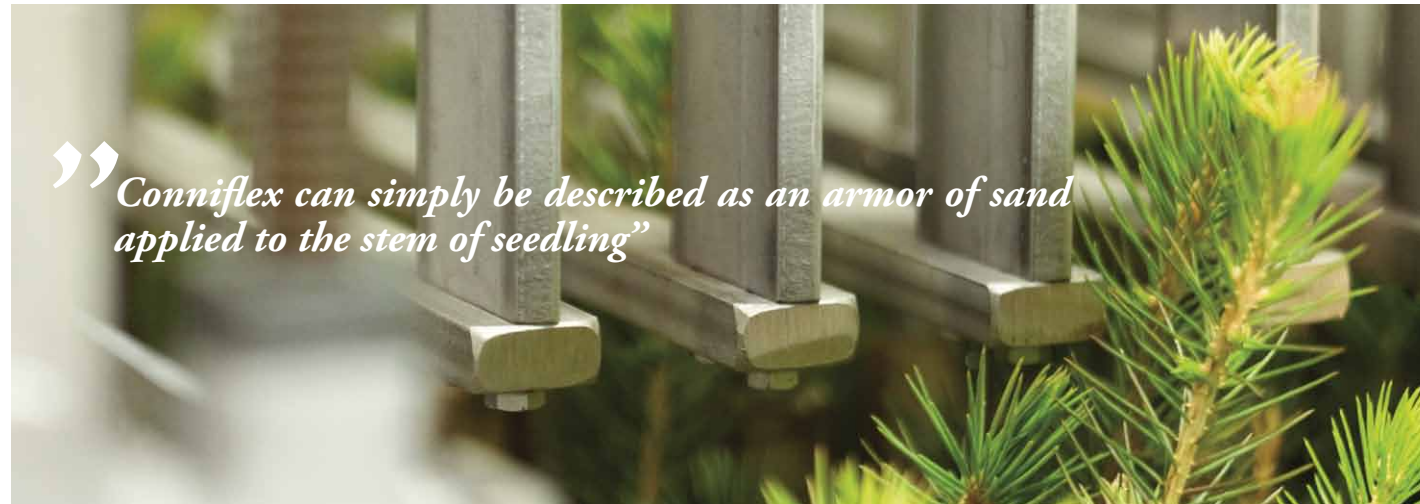


The common pine weevil, *Hyllobius abietis*, is causing the Swedish forestry sector major damage. Experts estimate damages cost up to nearly one billion Swedish Kronor annually! Over the past 150 years, scientists have developed various protection methods to reduce pine weevil attacks in our forests. Stump extraction, metal collars, prescribed rest and numerous insecticides are just some methods that have been tested. Since the 1940s and onwards, insecticides have almost exclusively been the most common protection method against the pine weevil. This type of protection has shown to have a relatively high protective effect, but a negative impact on the environment.

The Swedish Chemical Inspectorate, Keml, and Forest Stewardship Council, FSC, have long been working on regulating the use of insecticides and actively worked for a forest industry free from insecticides. The decisions and guidelines that are now established from these organisations are clear and confirmed. The use of insecticides for protection against the pine weevil is no longer accepted. However, FSC has granted a short-term exemption for the use of some insecticides to several plant producers. This is approved only if an action plan towards an environmentally friendly method of treatment is shown.

It is obvious that the Swedish forest industry and other markets with similar problems need a long-term sustainable protection against the pine weevil, a method which is both effective and environmentally friendly.

02. Concept of Conniflex



Conniflex is the new, effective and environmentally friendly coating method, protecting the forest seedling against pine weevil attacks. Conniflex as a protection method was first initiated and developed by researchers at the Swedish University of Agricultural Sciences, SLU.

Conniflex can simply be described as an armor of sand applied to the stem of seedling. The coating is flexible and expands as the seedling grows. The specially developed and water-based glue is used to guarantee that the sand bonds to the stem. The treatment is completed in the drying unit for hardening of the glue.

Independent researchers have conducted numerous field tests of Conniflex starting several years back. The results clearly demonstrated similar levels of protection using Conniflex compared to insecticides. But treating seedlings with Conniflex has, in contrast to insecticides, no impact on the environment and is safe for the nursery staff to use.

The seedlings are treated with Conniflex in the nursery before they are packed and sent away to the forest owner. Only one treatment in the nursery is necessary for an effective protection for two years. Conniflex can be used on all types of containerized seedlings.

BCC has spent considerable time developing the Conniflex concept and technical solution to integrate with industrial processing lines. In addition, BCC is also the supplier of sand and glue for the Conniflex system.

Conniflex is a co-operation between BCC and Sveaskog's wholly owned subsidiary, Svenska Skogsplantor. Sveaskog owns the Conniflex brand since 2005



03. Gluing unit

Before packing and delivery, seedlings will be treated with Conniflex.

Growing trays are placed in an automatic frame handling system. The trays are pushed from the frame and onto the belt conveyor and guided into the gluing unit. It is important to first wet approximately two thirds of the stem using water jets. This is sufficient for effective application of the glue. Water jets are used for the water-based glue to bond firmly to the stem.

The trays are then transported to the gluing unit, where the seedlings are gently separated by a diagonal raking comb allowing nozzles to apply the glue. The glue is supplied from a 1000-liter container using adjustable flow and pressure. Surplus glue is collected in a separate container. The tray is finally transported to a vibrating plate in which the glue is evenly distributed to the stem.

The tray is then transported on the belt conveyor and towards the sanding station.

“The seedlings are gently separated by a transversal comb and to allow nozzles to apply the environment-friendly glue”



04. Sanding unit

carefully fractioned, partly to counter attacks by pine weevil jaws and partly to avoid creating gaps in the protection. Surplus sand is collected in a hopper, then filtered and transported back into the system for re-use. Wet sand, needles and other particles are separated by sieving and guided to a collection vessel.

After coating, the tray is transported on the belt conveyor and towards the final drying unit.

After the glue has been applied, the trays are transported via a vertical lift onto the conveyor belt that transfers them to the sanding unit. This is where the actual protection is done.

Two trays are pushed in simultaneously into the enclosed sanding station. In order to achieve a high production rate, four trays are coated simultaneously. Two trays are tilted to the right and two trays to the left. Both sides of the seedling trays are treated.

Sand falls from the upper storage unit through the air jets which carefully blows fine grains of sand onto the seedling stem. Sand grains have been



”*Sand grains have been carefully fractioned, partly to counter attacks by pine weevil jaws and partly to avoid creating gaps in the protection*”



05. Drying unit

”*Fan and heating system in each drying module ensures the optimal temperature and that air is forced through the seedlings*”

After the coating process the glue needs to be hardened before the protection is complete and the seedlings can be packed. This is done in a controlled environment in the drying unit to avoid drying out or damage to the seedling.

The seedlings are transported slowly through the drying system's three levels. The speed of the belt conveyors is individually adjustable for flexibility. The fan and heating system in each drying module ensures that the optimal temperature is maintained and that air is forced through the seedlings. The seedlings are transported between the floors by the means of elevators. The entire drying process takes about 30-35 minutes.

When seedlings come out of system they are transported to a water bath. It is important to wet the rootplugs of the seedlings before packing or further storage.

The seedlings are now effectively protected by Conniflex and ready for planting in your forest.



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