The Hungarian spruce scale, *Physokermes inopinatus,* was detected for the first time in Sweden in 2010, when it infested 1 000 ha of Norway spruce. Why did this happen and why have its native close relatives, *P. piceae* and *P. hemicryphus*, never caused comparable damages? Insects are known to react to climate change, e.g., with respect to phenology, number of generations per year, mobility, or dispersal range. Changes like these can increase the damage caused by known pests. Also insects without any former pest record could develop abilities to colonize, even seriously infest, new areas at long distances from earlier records. We have focused on clarifying possible differences in the life cycle and habitat requirements of the three *Physokermes* spp., to provide answers to the questions above. Due to their hidden and discrete life style they have been studied to a very limited extent before our investigations. We here report results from studies on their morphology, life cycle, and host preferences, which will give insights into their adaptation abilities. Thereby, we will be able to evaluate the actual pest value of the species as well as supply information for a general, species comprehensive, management of invasive or new pests.

Posters

Monitoring air-, water-, and insect-borne invasive forest pathogens in Sweden. Boberg, J., Stenlid, J., Oliva, J. (*Swedish University of Agricultural Sciences, Sweden; johanna.boberg@slu.se; jan.stenlid@slu.se; Jonas.Oliva@slu.se*).

An efficient detection of invasive forest pathogens can be achieved by targeting their main dispersal pathways. Forest pathogens typically disperse by air or water, or they are vectored by insects. Currently in Sweden, we are testing whether different types of trapping systems can be used in monitoring schemes. Airborne pathogens disperse by spores that can be captured by passive or active traps. Water filters can be used to concentrate and separate propagules in river water. Detection of insect-vectored pathogens requires capturing the vector with pheromone traps and then identifying the pathogen within the vector. In all pathways we intend to identify the species by using unspecific high through-put DNA sequencing techniques. To validate this monitoring approach, we will use already established invaders such as *Chalara fraxinea*, *Phytophthora alni*, *Ophiostoma novo-ulmi*, and *Sphaeropsis sapinea*. Spore catchments will be used to study the relationship between conductive weather conditions and propagule production to understand which seasons capture the highest variation. Some of the potentially threatening invaders for Sweden are not yet present, or have not been detected, but occur in southern European forests. Some of the trapping schemes have been replicated in Spain to validate the monitoring scheme to be used as an early detection tool for known invaders.

Neonectria canker on true fir in western USA. Chastagner, G. (*Washington State University, USA; chastag@wsu.edu*), Talgø, V. (*Norwegian Institute for Agricultural and Environmental Research, Norway; venche.talgo@bioforsk.no*), Riley, K. (*Washington State University, USA; klriley@wsu.edu*).

Neonectria neomacrospora causes severe damage to fir (*Abies* spp.) in Scandinavia. In August 2013, a survey was carried out in Washington, Idaho, and Oregon to determine if this pathogen is also damaging firs in the Pacific Northwest (PNW), USA. Typical symptoms were canker wounds, resin flow, and branch dieback. Characteristic red fruiting bodies (perithecia) of *Neonectria* were found on 16 hosts in Washington and Oregon: *A. alba* (European silver fir), *A. amabilis* (Pacific silver fir), *A. balsamea* (balsam fir), *A. balsamea* var. *phanerolepis* (Canaan fir), *A. bornmuelleriana* (Turkish fir), *A. cephalonica* (Greek fir), *A. concolor* (white fir), *A. fraseri* (Fraser fir), *A. grandis* (grand fir), *A. koreana* (Korean fir), *A. lasiocarpa* (subalpine fir), *A. magnifica* var. *shastensis* (Shasta red fir), *A. nordmanniana* (Nordmann fir), *A. numidica* (Algerian fir), *A. pinsapo* (Spanish fir), and *A. procera* (noble fir). The diseased trees were found in Christmas tree and landscape plantings. Morphological identification of *N. neomacrospora* was confirmed by internal transcribed spacer (ITS) sequencing and inoculation tests proved pathogenicity on selected hosts. Since *N. neomacrospora* is seed borne, the pathogen may have been introduced to Europe via seeds, but thus far the pathogen has not been found in areas where cones are harvested in the PNW.

Monitoring bark and ambrosia beetles in commercial forestry in Uruguay. Gómez, D., Martinez, G. (*National Agricultural Research Institute, Uruguay; dgomez@tb.inia.org.uy; gmartinez@tb.inia.org.uy*).

Bark and ambrosia beetles are part of the common fauna occurring in pine and eucalyptus plantations in Uruguay. In the last decades, these groups have been associated with sanitary problems in Uruguayan commercial forestry. In December 2009, following a long drought, a large infestation of bark beetles occurred on several *Pinus* spp. in Uruguay. Tree losses up to 80% were recorded in the southern part of the country, particularly on *P. pinaster*. Three insect species were the responsible for this outbreak: *Hylurgus ligniperda*, previously reported in 1967, *Cyrtogenius luteus*, and *Orthotomicus erosus*, the latter two being first records for the country. Six monitoring stations were established in pine plantations throughout the country in a cooperative effort between research institutes, forest companies, and the national government. A set of three interception traps were placed at each station to assess flight seasonality of these three species. In 2012, extensive surveys using ethanol-baited Lindgren traps in several eucalyptus plantations were added to the monitoring scheme, after ambrosia beetles species were collected from dead trees. These efforts constitute a necessary first step towards the understanding of the bark and ambrosia beetle fauna associated with commercial forestry in Uruguay.

Dead stands from Space: experiences with synergized multi-date medium-resolution imagery to describe damages caused by European bark beetle. Latifi, H. (*University of Wuerzburg, Germany; hooman.latifi@uni-wuerzburg.de*), Fassnacht, F. (*University of Freiburg, Germany; Fabian.fassnacht@felis.uni-freiburg.de*), Kautz, M. (*Munich University of Technology, Germany; kautz@wzw.tum.de*), Dech, S. (*German Aerospace Center (DLR), Germany; Stefan.dech@dlr.de*), Schumann, B. (*University of Wuerzburg, Germany; bastian.schumann@freenet.de*).

Insect infestations have been reported to account for 60% of all sanitary forest damage in Europe. Following bark beetle attacks, an accurate spatiotemporal characterization of the affected area alleviates rapid post-attack management. Associating forest mortality and remotely sensed data has long been a main research focus. In contrary to North America, the tendency in Europe has often been towards applying high resolution data, since the majority of damage is spatially small to medium scale. We, however, believe that there are advantages in applying medium-resolution imagery whose multi-date availability is growing via