

Commentary - policy

Understanding the Other Party!

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Have you noticed that the forest products market has its fair share of international activities? You may live in an area where some of the pine sawlogs get packed in a container and shipped to Asia. Or maybe you are close to a facility that buys your wood chips to make them into a pellet to be shipped to Europe. Did you know that the large tract of timber down the road is owned by foreign investors? All of these activities seem to be happening in the forest products market, especially in the southeastern United States, and all of these activities and markets come with their own challenges. Containers need to be fumigated to decrease the risk of pests and diseases entering other countries, tolls on forest products may change market dynamics, wood pellets going to Europe need to be carbon-neutral, and maybe there are disagreements about the forest-management practices used.

We can certainly understand the need for pest and disease control and maybe also understand the need for tolls. We can probably understand the reasoning for wood pellets to be carbon-neutral, especially when they are used for energy production. What may be a bit harder to understand are disagreements about forest management. Especially in the southeast where we practice some intensive pine plantation management, we may experience some differences about the use of herbicides, prescribed fire, and monoculture management in general. Oftentimes, these differences are based on the forest-management practices used in the countries of a foreign investor or company. The culture that surrounds forest management in these countries also plays a vital role in explaining why disagreements about forest management may come up.

Understanding the differences in forest management and the culture between the United States and

other countries is important to explain the different viewpoints of forest management. In October of 2019, Clemson University hosted two educators/researchers from a German university. Part of the visit were tours of the Clemson Experimental Forest with a focus on Southern Yellow Pine plantations. When we talked about site preparation, planting, and the use of herbicides, the discussion got a little more intense. It was difficult for the visitors to understand why we are using herbicides and also why we focus on monocultures and clearcutting. Their current forest-management focus is to sustain a diverse forest with multiple species in a single forest stand to be prepared for the ramifications of climate change. While working with multiple tree species, their forest management policies also do not allow, or very much limit, the use of herbicides. In addition, the forest management they practice is mainly continuous cover forestry using close-to-nature and ecological forestry concepts. This means managing and maintaining a forest that has multiple uses (timber, recreation, wildlife habitat, etc.), represents great biodiversity, consists of multiple age-classes of trees, and is close to what a natural forest would look like in a given area. Although this is ideal, it may not always be possible to do that in countries and regions with different social or economic influences.

This is just an example of the different viewpoints of forest management. A good way to better understand the forest-management activities and limitations from other countries is to actually visit the country as part of a forestry tour or program. We believe that many disagreements can be solved by simply understanding the local economic factors, typical management practices, rules, and regulations of the other party. To help with this, we have offered a study-abroad program

for students at Clemson University that was also open and available to private forest owners and foresters. The program focuses on forest management and the history/culture of Germany and Switzerland, with forestry topics ranging from steep slope protection forest management to mixed-wood forests and, ultimately, high-quality veneer oak rotations. In May of 2017, three South Carolina forest owners and three forestry students joined the program for a 2-week program. An additional six forestry students joined the program in May of 2019. Many hours were spent in discussion of the differences between South Carolina and Germany/ Switzerland regarding the forest-management activities, and the unique challenges of each, but also the cultural differences and how these play a significant role.

The forests in Germany and Switzerland today are plentiful and cover about a third of the land area. The forests are dominated by European beech (*Fagus sylvatica*), English oak (*Quercus robur*), sessile oak (*Q. petraea*), and the introduced northern red oak (*Q. rubra*). Most of these species occur in a mixed forest with other hardwood and softwood species. Beech-dominated forests mostly occur in the southern and central part of Germany, whereas more oak-dominated forests exist in the northern part of the country. Forests in the Swiss Alps change composition with increasing elevation and transition from hardwood-dominated mixed forests to softwood-dominated forests oftentimes consisting of Norway spruce (*Picea abies*), European larch (*Larix decidua*), Swiss pine (*Pinus cembra*), and mountain pine (*Pinus mugo*). In both countries, there are also small areas and regions that consist of Norway spruce and European silver fir (*Abies alba*) and plantations of Scots pine (*Pinus sylvestris*).

The forests in these countries, however, did not always look like this. In fact, around 1700, the wood supply in Germany was largely depleted, and restoration of the natural forests that existed back then has not yet taken place in most areas. Centuries of use of the forest for fire wood, building materials, and lumber for wooden tools, and as a food source and pasture for livestock clearly took its toll. In addition, forest litter was oftentimes used as livestock bedding and thus removed many of the nutrients from the forest. In 1713, Hans Carl von Carlowitz framed the concept of sustainability in his treatise "Sylvicultura Oeconomica." This document provided a guide for the cultivation of native trees. Forest management changed at that time and started to become more sustainable with long-term

considerations of the impact of forest management on future timber supply.

Today, forests are managed mostly as continuous-cover forests. However, clearcutting may be used in some instances, given that there is a plan for reforestation. In some states of Germany, the clearcutting size is limited to less than 2.5 acres before a permit is required. With the average private forest size being 6 acres, clearcutting may not be a viable long-term solution for forest owners who plan on continuous revenue from their forest. With a cooler climate and much shorter growing season than the southeastern United States, rotation times for softwood species such as spruce and fir to sawtimber are 60–80 years. For high-quality oaks that are tended to be of veneer quality, the rotation time oftentimes ranges from 150 to 300 years. Given this, a stand regularly goes through the management regime of three to 10 or more foresters. In contrast to the southern United States, where pine plantations have a common rotation length of 25–35 years, these long rotation times in central Europe are rather extreme.

The regeneration of oak forests is an intense undertaking that takes careful consideration of the timing of harvests and the removal of a limited number of trees to ensure the establishment of an adequate number of oak seedlings before removing the majority of mature trees. Tending this newly regenerated stand will then also take a lot of time. Although not much is done until the trees in the forest stand are about 4–5 inches in diameter at breast height, a diameter that may take 20 years or longer to reach, a lot of intensive management is done afterwards. Future crop trees will be selected at this time, and about every 5–7 years a few of the competing trees surrounding the crop trees will be marked and taken out during a harvest. For oaks, it is important to have a shaded trunk to support the natural delimiting process. As oaks are susceptible to epicormic branching when exposed to too much sunlight, it is important during these harvests to leave enough shade on the trunk of the trees. This is why only one or two competing trees are removed around crop trees during each thinning. Epicormic branching is a big problem, as it will ruin a veneer log and thus degrade the value of a tree that may have been growing for multiple decades.

In the Swiss Alps, foresters are often less concerned with the economic function of a forest but rather manage them for the soil stabilization functions as so-called "protection forests." A protection forest is generally found on higher elevations on the slopes of

a valley with the goal of stabilizing soils and rocks to protect infrastructure at lower elevations in the valley, such as houses, roads, and railroads, from rockslides. Another function of a protection forest is to stabilize snow masses in the wintertime to prevent avalanches from starting and damaging the infrastructure. A lot of work goes into protection forests, and government subsidies are available for the management of these forests. Since many of these forests are situated on very steep slopes, the only harvesting method used in the management of these forests is the use of cable systems, which are fairly costly to operate. Establishing a new forest in the Alps to create a new protection forest is also very costly, as trees cannot just be planted but need to be protected from the snow masses in the winter and also from avalanches that may break the seedlings and saplings. This protection oftentimes comes in the form of steel constructions called "snow bridges" that are designed to hold back and stabilize the snow so that the seedlings can establish and grow. With the colder temperatures and shorter growing season at high elevations, it will be decades before the seedlings will have grown into a forest that will stabilize snow masses.

With an increasing biomass market in central Europe, many forest owners try to capitalize on that through the use of woody biomass from their harvests. A second popular management style is to grow short-rotation coppice (SRC) plantations of fast-growing and root-sprouting species such as poplar species (*Populus* spp.). Oftentimes, SRC stands are established on old agricultural fields and generally grow for 3–7 years before they get clearcut. Some landowners also mix SRC into a form of silvopasture management by having

SRC trees grown in a fenced pasture with red deer or egg-laying chickens. In the latter case, rows of SRC are planted to the left and right of a chicken coop with enough green space in between the SRC plantings to allow chickens to find feed. The idea here is that the SRC trees will provide protection from predator birds such as hawks, as chickens can move among the saplings, and the trees will never grow large enough to act as a perch for a predator. Having a viable and strong biomass market is also a major difference between the southern United States and central Europe. Biomass markets in the rest of the United States may be better than in the southeast, but central Europe is much stronger and more advanced in the use of biomass at a commercial level. This is primarily because of electric power production, biomass furnaces and boilers in public buildings and hospitals, and even small community or neighborhood facilities that provide heat to a series of homes.

All this information here cannot do justice to experiencing this type of management firsthand. It is invaluable to talk with forestry professionals in these countries to learn more about the reasons, the challenges, and the solutions that they use in their forest-management activities. Much of the cultural aspect other than what is known from textbooks is difficult to describe in words and truly has to be experienced. A combination of understanding forest management and understanding the culture that goes with that is invaluable to fully comprehend the different forest product markets, their limitations, and restrictions. There is simply no substitute for that experience, but taking an opportunity to have an open dialogue with visiting forestry professionals may go a long way.