AGGP-Agroforestry

SCOTS PINE SHELTERBELTS IN SASKATCHEWAN

No. SASK-8

by BEYHAN Y. AMICHEV

Scots pine (*Pinus sylvestris* L.) trees were made available to farmers through the Government of Canada's Prairie Shelterbelt Program (PSP). Since the 1930s, Scots pine trees were planted in farmyards to protect infrastructure and in field to reduce soil erosion (Figure 1). Field sampling indicated that planted Scots pine shelterbelts varied in age (8–60 yrs.), designs (1–14 rows with 1–6 m spacing between trees within a row), and planting arrangement, combined with up to four other species. Scots pine was planted together with American elm, caragana, Colorado spruce, green ash, hybrid poplar, Manitoba maple, Siberian elm, white spruce, and blue spruce.

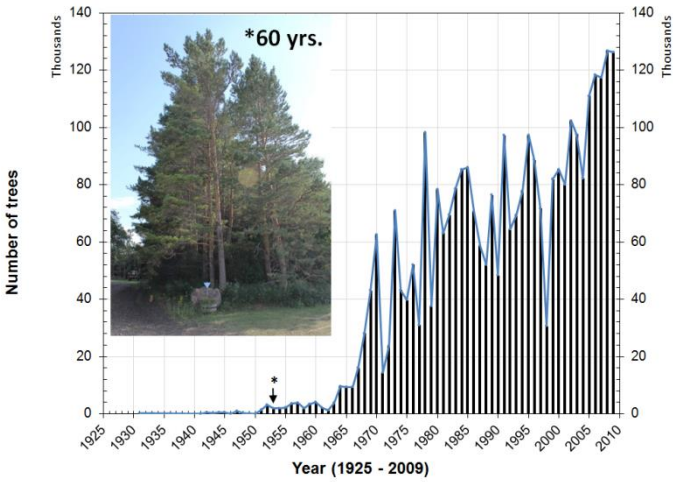

Figure 1. Historical record of the number of Scots pine shelterbelt trees ordered through the PSP in Indian Head, Saskatchewan (* indicates the planting year of the shelterbelt shown in the photograph).

SHELTERBELT MAPPING: WHERE AND WHEN

Where: During the course of eight decades, greater than 1.96 million Scots pine trees were planted on cultivated agricultural land, which was mapped with 72% accuracy (Figure 2). This signifies the first mapping of Scots pine shelterbelts in Canada.

When: Novel, decadal time-lapse series of shelterbelt distribution maps were created to identify important historical factors that influenced planting of Scots pine shelterbelts in Saskatchewan (Figure 2). Scots pine shelterbelt establishment was minimal up to the mid-1970s and was focused in areas immediately next to major roadways. More extensive shelterbelt planting occurred in the 1980s (>60,000 trees yr^{-1}), and further increased in the 1990s and 2000s mainly within the Boreal transition zone (Gray and Dark Gray soil zones) and in proximity to larger cities.

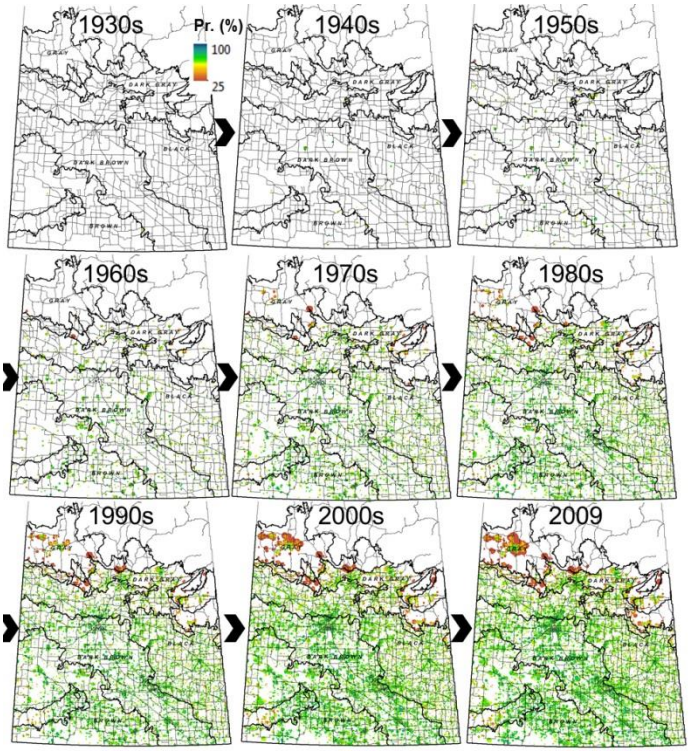

Figure 2. Decadal time-lapse (1925–2009) series of probability (%) maps of expected Scots pine shelterbelt establishment in Saskatchewan.

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SHELTERBELT LENGTH AND DISTRIBUTION

- A unique land clustering approach spanning five soil zones was designed and utilized (Figure 3).
- The total length of Scots pine shelterbelts in Saskatchewan was 1,573 Km, and ranged from 19 to 1,352 Km in the Dark Brown > Brown > Dark Gray > Black > Gray soil zones, in descending order (Figure 3).
- About 86% of all Scots pine shelterbelts were planted in the Dark Brown soil zone. Mapped shelterbelt 'hot spots' within the Dark Brown soil zone were farms near four larger cities – Saskatoon, Regina, Moose Jaw and Weyburn.
- A linearly increasing trend of Scots pine tree orders since the mid-1970s (Figure 1) contrasts a decreasing trend of the overall shelterbelt tree orders from the PSP from 1990 to 2009, largely due to Scots pine trees being planted preferentially in farmyard shelterbelts, as opposed to field shelterbelts.

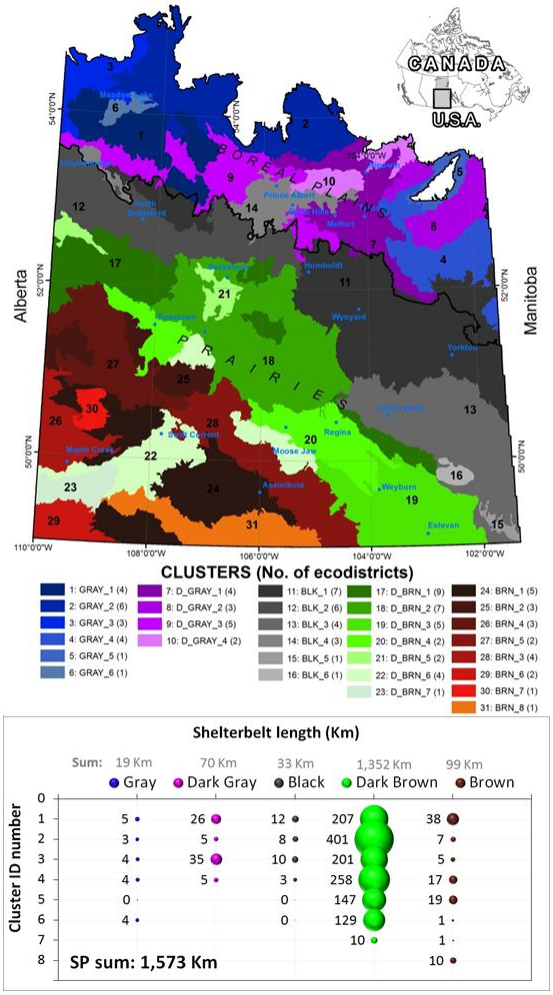

Figure 3. Location of agricultural areas in Saskatchewan with expected length of Scots pine shelterbelts.

FURTHER READING

Amichev, B.Y., et al. 2015. **Mapping and quantification of planted tree and shrub shelterbelts in Saskatchewan, Canada.** *Agroforestry Systems* 89(1):49-65

AGGP Fact Sheet(s): **SASK-1 through SASK-3, SASK-15**

CONTACT FOR MORE INFORMATION: SASKAGROFORESTRY.CA/

ACKNOWLEDGEMENTS & COPYRIGHT

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