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GREEN ASH SHELTERBELTS IN SASKATCHEWAN

by BEYHAN Y. AMICHEV

No. SASK-7

Green ash (*Fraxinus pennsylvanica* Marsh) trees were made available to farmers through the Government of Canada's Prairie Shelterbelt Program (PSP). Since the 1930s, green ash trees were planted in farmyards to protect infrastructure and in field to reduce soil erosion (Figure 1). Field sampling indicated that planted green ash shelterbelts varied in age (5–80 yrs.), designs (1–11 rows with 1.5–4.5 m spacing between trees within a row), and planting arrangement, combined with up to five other species. Green ash was planted together with Bur oak, caragana, hybrid poplar, lilac, Manitoba maple, Siberian elm, Colorado spruce, Scots pine, acute willow, sea buckthorn, buffalo berry, white spruce, and dogwood.

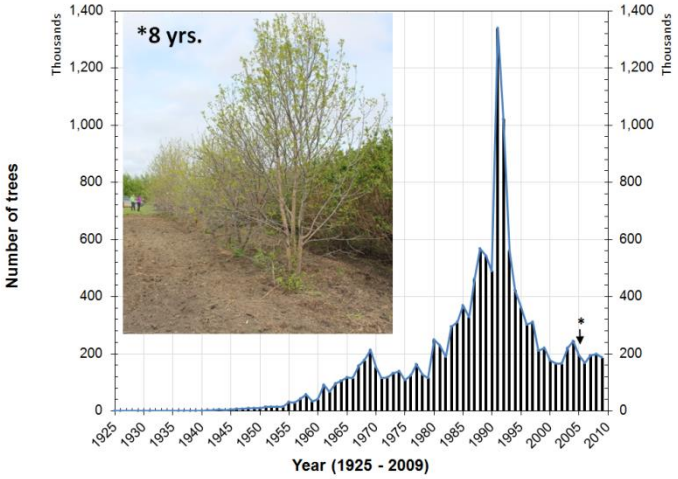

Figure 1. Historical record of the number of green ash shelterbelt trees ordered through the PSP in Indian Head, Saskatchewan (* indicates the planting year of the shelterbelt shown in the photograph).

SHELTERBELT MAPPING: WHERE AND WHEN

Where: During the course of eight decades, greater than 9.91 million green ash trees were planted on cultivated agricultural land, which was mapped with 52% accuracy (Figure 2). This signifies the first mapping of green ash shelterbelts in Canada.

When: Novel, decadal time-lapse series of shelterbelt distribution maps were created to identify important historical factors that influenced planting of green ash shelterbelts in Saskatchewan (Figure 2). Green ash shelterbelt establishment was uniform up to the late 1960s when tree orders reached >200,000 yr^{-1} and was focused in areas immediately next to major roadways. In the 1970s and 1980s shelterbelt establishment extended to some intersections and in the 1990s and 2000s expanded further, peaking at >1.3 million tree orders yr^{-1} in 1991.

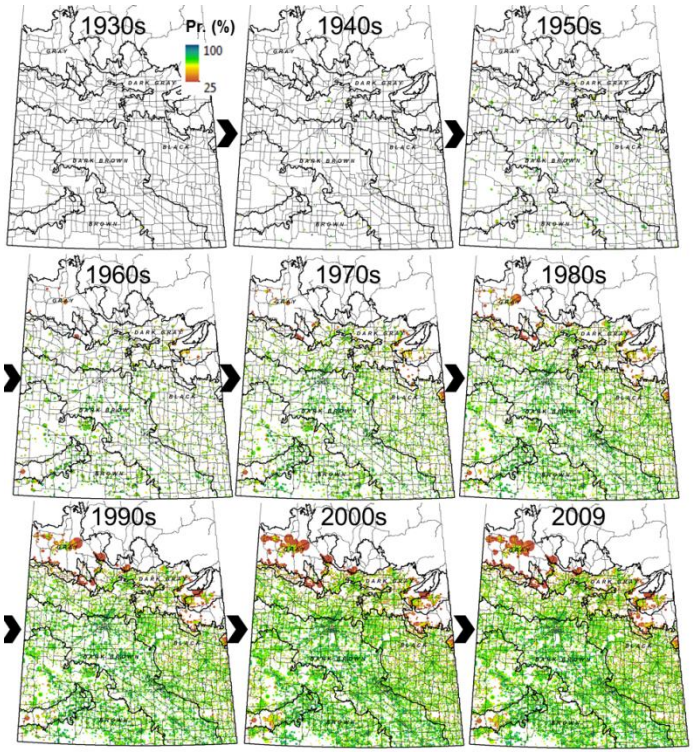

Figure 2. Decadal time-lapse (1925–2009) series of probability (%) maps of expected green ash shelterbelt establishment in Saskatchewan.

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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 green ash shelterbelts in Saskatchewan was 5,841 Km, and ranged from 25 to 4,856 Km in the Dark Brown > Brown > Black > Dark Gray > Gray soil zones, in descending order (Figure 3).
- About 83% of all green ash shelterbelts were planted in the Dark Brown soil zone. Mapped shelterbelt 'hot spots' within the Dark Brown soil zone were farms near three larger cities – Saskatoon, Regina, and Weyburn.
- Green ash tree orders are in a decreasing trend since the 1991 peak year (Figure 1), largely due to advances in direct-seeding technology leading landowners to believe that soil erosion could be prevented without the use of shelterbelts. This trend is similar to the decreasing trend of overall shelterbelt tree orders from the PSP from 1990 to 2009.

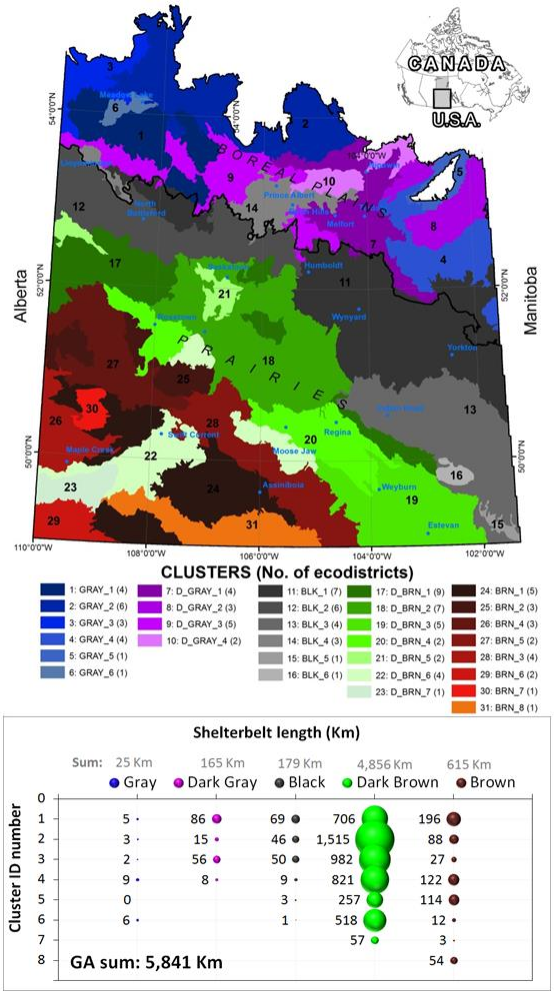

Figure 3. Location of agricultural areas in Saskatchewan with expected length of green ash shelterbelts.

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-14**

CONTACT FOR MORE INFORMATION: SASKAGROFORESTRY.CA/

ACKNOWLEDGEMENTS & COPYRIGHT

This research was done by a team of collaborators from the University of Saskatchewan, University of Regina, and Agriculture and Agri-Food Canada (AAFC), under the leadership of Dr. Ken Van Rees of the University of Saskatchewan. Funding was provided by Agriculture and Agri-Food Canada (AAFC)'s Agricultural Greenhouse Gases Program (AGGP). We thank the AAFC Agroforestry Development Centre at Indian Head, SK for providing the shelterbelt tree data. This fact sheet was completed in May 2016.