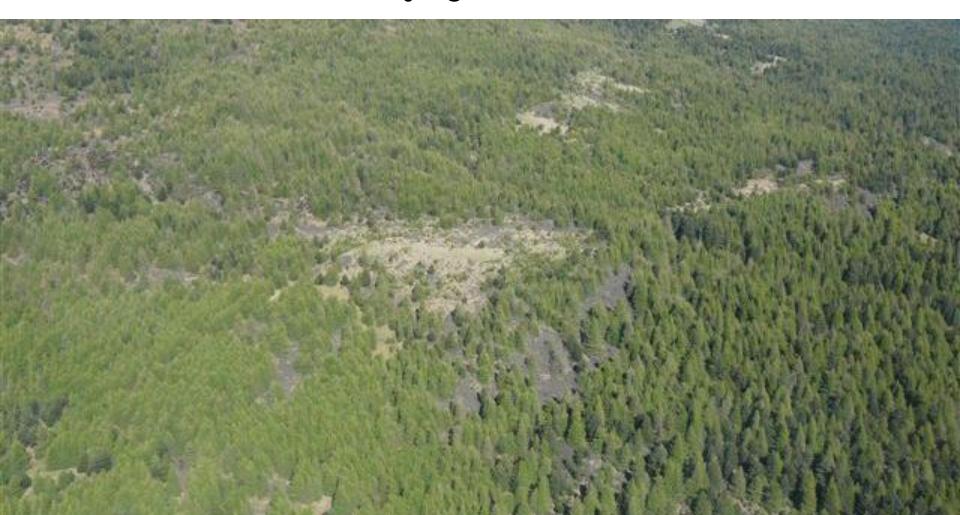


Wilding Conifer Control in New Zealand.

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Three way -collaboration











Introduction

- Conifers planted for erosion control (1880's) and subsequent commercial plantations have created unwanted wilding tree spread.
- Wildings cover >200 000 ha Department of Conservation administered land in the South Island of New Zealand.
- Area increases to over 500 000 ha when private land is included.
- The New Zealand Department of Conservation requires wilding pines to be lawfully controlled in terms of Reserves, National Parks & Conservation Acts.



History

- Diquat desiccant spray, followed by fire.
- Very effective, dry fuel, hot fires.
- Fire no longer an acceptable management option.
- Diquat alone not effective, especially for larger trees.
- Mid Dome drift incident January 2004.
 - Fixed wing aircraft
 - 80l/ha
 - small droplets, VMD < 250μm
- 2005 DoC national workshop on management of Wilding Conifers, identified two clear problems :
 - Herbicide choice
 - Application methods

Objectives

- Conduct aerial herbicide trials to investigate the efficacy of environmentally acceptable alternative herbicide treatments to diquat.
- Cost effective compared to current, ground-based control methods.
- Optimise and improve aerial application methods.
 - Low drift potential VMD 350 to 450 μm
 - Sufficient coverage





Wilding species

Initial trials, three biggest problem conifer species:

- Pinus contorta
- Pinus mugo
- Pseudotsuga menziesii

Additional two conifer species identified:

- Pinus nigra
- Pinus sylvestris



Two different problems

Development of systems for Wilding Conifer control

- Boom spray of dense conifer infestations
- Spot treatment of scattered outliers





Program history & progression

- Scion subcontracted by Landcare, Beating Weeds program.
- Developed in collaboration with DoC (Pete Raal & Peter Willemse).
- 19 field trials, 11 boom field trials & 8 spot trials.





Application methods – boom spraying

- 1st boom trials, helicopter calibrated to deliver 150 ℓ/ha.
- 2nd boom trials, helicopter calibrated to deliver 400 ²/ha.
- Calibrated helicopters.
- Hydraulic nozzles.
- 8m boom.
- Release height, 10 m.
- VMD of approximately 350 450 μm
- Low drift potential.





Application methods – spot spraying

- Designed & developed a calibrated spot gun. (Eschenmoser, Willemse, Raal & Gous)
- 1st spot trials, spot gun calibrated to deliver 500ml / spot.
- 2nd spot trials, spot gun calibrated to deliver 1l / spot.



Results – Boom Spray

Lucifer Brew!!!

- 20 l Grazon + 20 l Tordon + 10 l Dicamba + 4 kg Ammonium
 Sulphate + 20 l Kwiken oil, applied in 400 l / ha.
- 98% kill, Pinus contorta, P. nigra, P. sylvestris, Ps. menzesii
- Trees up to 10 m tall.







Results – Spot Spray

- 20% Grazon in paraffinic spray oil.
- Applied at 1 l/tree into tree crown.
- 100% kill, Pinus contorta, P. nigra, P. sylvestris, P. mugo & Ps. menziesii
- Trees up to 12 m tall.



Conclusions

For the 2011/2012 spraying season, the Department of Conservation has gone fully operational with both the boom and spot treatments based on the preliminary results of this projects results.



Publications

- Herbicide screening trial to control dormant wilding Pinus contorta, P. mugo and Pseudotsuga menziesii during Winter. BY Stefan Gous Michael Watt, Brian Richardsona and Mark Kimberley.
- Herbicide screening pot trial for wildling conifer control *Pinus contorta, P. mugo* and *Pseudotsuga menziesii*. BY Stefan Gous Michael Watt, Brian Richardsona and Mark Kimberley.

In Press

- Aerial spot treatment to control Pinus contorta and P. nigra ssp. Laricio. By Stefan Gous, Peter Raal, Michael S. Watt.
- Aerial herbicide spraying to control wilding Pinus contorta in New Zealand. By Stefan Gous, Peter Raal, Michael S. Watt.



