Notes on flammability

Summary

Low flammable plants are those with low dead matter, large green leaves with high moisture content and low oil contents. So flax with the dead trimmed off is lowly flammable but one left with lots of dead matter is flammable and can explode in fire. In dry conditions leaves moisture content falls and many low flammable trees can still burn.

Growth form affects flammability, herbaceous flowering plants is less flammable than grasses, trees and shrubs

Across the world trees that come from places where fire is common are more likely to be more flammable.

Flammability is a feature of plant families but there can be variation in species depending on the environment in which they live.

Individual trials New Zealand.

https://www.publish.csiro.au/wf/Fulltext/WF15047 a 2015 study of NZ plangs

Few studies of vegetation flammability have been undertaken in NZ and only one has compared the flammability of indigenous plants; this was a qualitative assessment derived from expert opinion. We addressed this knowledge gap by measuring the flammability of terminal shoots from a range of trees and shrubs found in NZ. We quantified shoot flammability of 60 indigenous and exotic species, and compared our experimentally derived ranking with expert opinion.

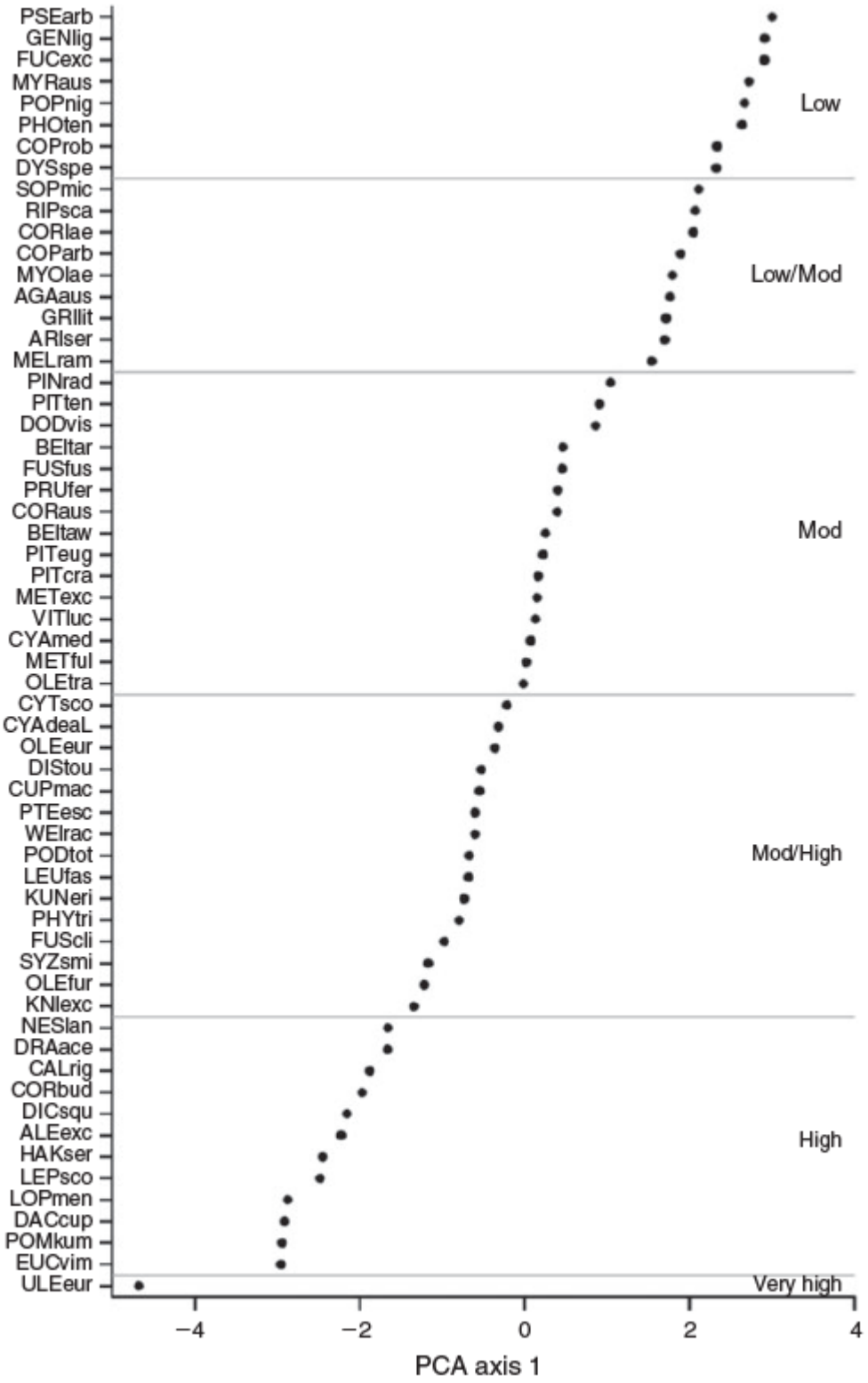
Five finger, Mapou, Swamp flax, cabbage tree (low dead leaves, Kohekohe, Coprosma Robusta, Coprosma Grandifolia (not in trial but will be there)

Low/Moderate Kowhai, Supplejack, Karaka, Mamingi, Ngaio

Worst in flammability are gorse, gums, Kumarahou, Rimu, silver beech, manuka

Species key and data below.

Kauri (*Agathis australis* (D.Don) Lindl. ex Loudon)	AGAaus
Tītoki (*Alectryon excelsus* Gaertn.)	ALEexc
Makomako (*Aristolelia serrata* (J.R.Forst. and G.Forst.) W.R.B.Oliv.)	ARIser
Taraire (*Beilschmiedia tarairi* (A.Cunn.) Benth. And Hook.f. ex Kirk)	BEItar
Tawa (*Beilschmiedia tawa* (A.Cunn.) Benth. and Hook.f. ex Kirk)	BEItaw
Bottlebrush (*Callistemon rigidus* R.Br.)	CALrig
Māmāngi (*Coprosma arborea* Kirk)	COParb
Karamū (*Coprosma robusta* Raoul)	COProb
Cabbage tree (*Cordyline australis* (G.Forst.) Endl.)	CORaus
Korokio (*Corokia buddleioides* A. Cunn.)	CORbud
Karaka (*Corynocarpus laevigatus* J.R.Forst. and G.Forst.)	CORlae
Macrocarpa (*Cupressus macrocarpa* Hartw. Ex Gordon)	CUPmac
Ponga (*Cyathea dealbata* (G.Forst.) Sw.)	CYAdea
Mamaku (*Cyathea medullaris* (G.Forst.) Sw.)	CYAmed
Scotch Broom (*Cytisus scoparius* (L.) Link)	CYTsco
Rimu (*Dacrydium cupressinum* Lamb.)	DACcup
Whekī (*Dicksonia squarrosa* (G.Forst.) Sw.)	DICsqu
Matagouri (*Discaria toumatou* Raoul)	DIStou
Akeake (*Dodonaea viscosa* Jacq.)	DODvis
Dracophyllum acerosum Berggr.	DRAace
Kohekohe (*Dysoxylum spectabile* (G.Forst) Hook.f.)	DYSspe
Manna Gum (*Eucalyptus viminalis* Labill.)	EUCvim
Kōtukutuku (*Fuchsia excorticata* (J.R.Forst. and G.Forst.) L.f.)	FUCexc
Mountain Beech (*Fuscospora cliffortoides* (Hook.f.) Heenan and Smissen)	FUScli
Red Beech (*Fuscospora fusca* (Hook.f.) Heenan and Smissen)	FUSfus
Hangehange (*Geniostoma ligustrifolium* A.Cunn.)	GENlig
Broadleaf (*Griselinia littoralis* Raoul)	GRIlit
Prickly Hakea (*Hakea sericea* Schrad. and J.C.Wendl.)	HAKser
Rewarewa (*Knightia excelsa* R.Br.)	KNIexc
Kānuka (*Kunzea ericoides* (A.Rich) Joy Thomps. *sensu lato.*^)	KUNeri
Mānuka (*Leptospermum scoparium* J.R.Forst. and G.Forst.)	LEPsco
Mingimingi (*Leucopogon fasciculatus* (G.Forst.) A.Rich.)	LEUfas
Silver Beech (*Lophozonia menziesii* (Hook.f.) Heenan and Smissen)	LOPmen
Māhoe (*Melicytus ramiflorus* J.R.Forst. and G.Forst.)	MELram
Pōhutukawa (*Metrosideros excelsa* Sol. ex Gaertn.)	METexc
Rata (*Metrosideros fulgens* Sol. ex Gaertn.)	METful
Ngaio (*Myoporum laetum* G.Forst.)	MYOlae
Māpou (*Myrsine australis* (A.Rich.) Allan)	MYRaus
Maire (*Nestegis lanceolata* (Hook.f.) L.A.S.Johnson)	NESlan
European Olive (*Olea europaea* L.)	OLEeur
Akepiro (*Olearia furfuracea* (A.Rich) Hook.f.)	OLEfur
Chatham Island Akeake (*Olearia traversiorum* (F. Muell.) Hook.f.)	OLEtra
Flax (*Phormium tenax* J.R.Forst. and G.Forst.)	PHOten
Tanekaha (*Phyllocladus trichomanoides* D.Don)	PHYtri
Radiata Pine (*Pinus radiata* D.Don)	PINrad
Karo (*Pittosporum crassifolium* Banks and Sol. ex A.Cunn.)	PITcra
Tarata (*Pittosporum eugenioides* A.Cunn)	PITeug
Kohuhu (*Pittosporum tenuifoluum* Sol. ex Gaertn.)	PITten
Tōtara (*Podocarpus totara* G.Benn. ex D.Don)	PODtot
Kūmarahou (*Pomaderris kumeraho* A.Cunn.)	POMkum
Lombardy Poplar (*Populus nigra* L.)	POPnig
Miro (*Prumnopitys ferruginea* (D.Don) de Laub.)	PRUfer
Five-finger (*Pseudopanax arboreus* (Murray) Philipson)	PSEarb
Bracken (*Pteridium esculentum* (G.Forst.) Cockayne)	PTEesc
Supplejack (*Ripogonum scandens* J.R.Forst. and G.Forst.)	RIPsca
Kōwhai (*Sophora microphylla* Aiton)	SOPmic
Monkey Apple (*Syzygium smithii* (Poir.) Nied.)	SYZsmi
Gorse (*Ulex europaeus* L.)	ULEeur
Pūriri (*Vitex lucens* Kirk)	VITluc
Kāmahi (*Weinmannia racemosa* L.f.)	WEIrac



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In 2020 a student completed a pHD on evolution of flammability using 194 species (120 native and 74 species) collected predominantly in South Island of New Zealand with the goal of looking variability of flammability and therefore the evolution of flammability. It is very difficult to extract the information on what species are the least flammable which was very disappointing to me.

https://livingheritage.lincoln.ac.nz/nodes/view/37395

https://researcharchive.lincoln.ac.nz/server/api/core/bitstreams/65f4153e-79eb-4796-9ab6-c6b52ee73a07/content

Other resources

https://fireandemergency.nz/outdoor-and-rural-fire-safety/protect-your-home-from-outdoor-fires/flammability-of-plant-species/#low

St Arnaud taking charge of community preparedness | Fire and Emergency New Zealand (see video in this link)

- 1709 Brochure.pdf (fire.tas.gov.au)
- report.PDF (fireandemergency.nz)
- https://www.nzfoa.org.nz/resources/file-libraries-resources/fire/671-forest-fire-risk-management-guidelines-1
- Flammability of Plant Species | Fire and Emergency New Zealand
- Forest management | Fire and Emergency New Zealand
- Manage forest fire risks | Canopy

Fire resources

https://www.nzffa.org.nz/system/assets/3228/20.10.18.FireSafetyForRuralLiving.Brochure.v13.pdf

https://www.nzffa.org.nz/farm-forestry-model/resource-centre/tree-grower-articles/may-2012/fire-management-for-small-forests/

https://fireandemergency.nz/assets/Documents/Farms-rural-properties/FENZ-1427-Wildfire-Safer-Housing-Guide-FA_5_Digital-Spreads.pdf