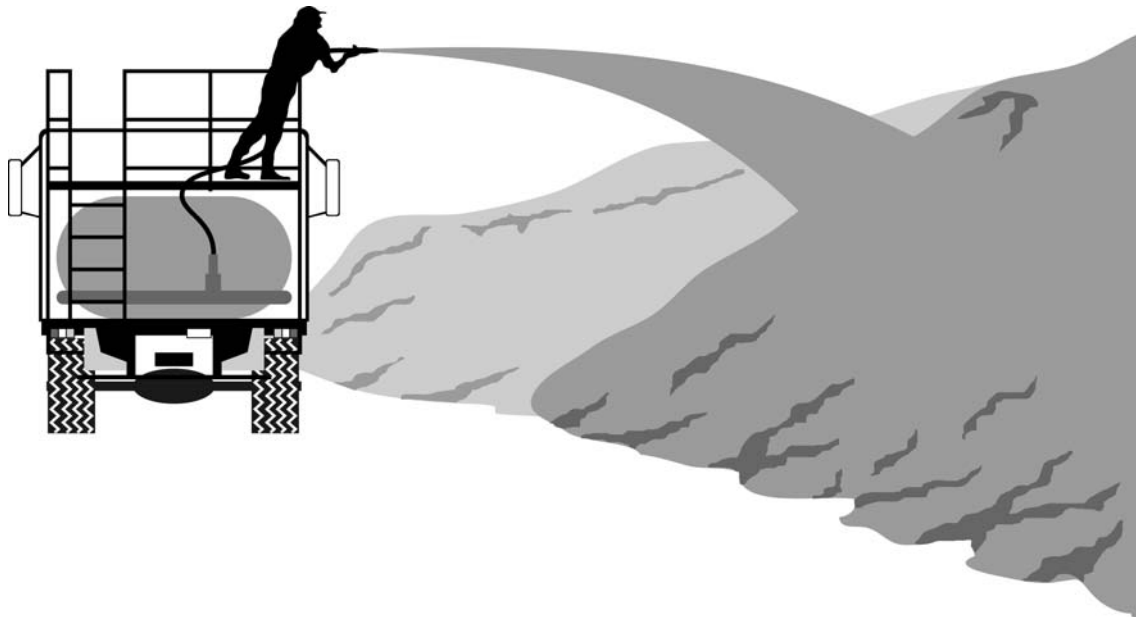


Mulch Tackifiers

EROSION CONTROL TECHNIQUE

Revegetation		Temperate Climates	✓	Short-Term	✓
Non Vegetation		Wet Tropics	✓	Long-Term	
Weed Control		Semi-Arid Zones	✓	Permanent	



Key Principles

1. Critical attributes of a mulch tackifier is its ability to anchor the applied mulch and prevent, or at least minimise, movement of the mulch as a result of rainfall, plant watering, wind and gravity.
2. Choice of tackifier primarily depends on expected and/or probable rainfall intensity and wind strength, land slope, type of mulch, and required ability to either assist (revegetation) or restrict (weed control) emerging vegetation.

Design information on the selection and used of tackifiers and other products for the direct stabilisation of soil surfaces (i.e. without the application of mulch) is provided in a separate fact sheet on 'Soil Binders'.

Design Information

Tackifiers are used to anchor the mulch, and reduce displacement by wind, water and gravity.

Tackifiers generally fall into one of the following three categories:

- vegetable-based adhesives
- copolymers
- petroleum oils and resin-emulsions

Vegetable-based adhesives have an effective operational life of 3 to 6 months within temperate climates during periods of normal rainfall.

Copolymers are mixed with water prior to application and are both photo- and chemically-degradable with an effective operational life of about 1 year. This operational life can be reduced by such things as freezing conditions.

Petroleum oils and resin-emulsion binders are also photo- and chemically-degradable with an effective operational life of about 1 year.

Tackifiers such as PVA glue and anionic bitumen emulsions can be used for short fibre mulches.

Chemical tackifiers or mechanical anchoring may be used to hold the mulch in position to reduce loss by wind and water, especially on sloping ground. Methods include:

- Lightly discing into the ground.
- Tracked construction machinery working up and down the slope.
- Covering with a suitable mesh such as jute or coir mesh.
- Application of a slow setting anionic bitumen emulsion (AS1160) which is suitable for either wet or dry surfaces—normal application rate of 1000 to 2000L/ha of 50:50 anionic bitumen emulsion.
- Application of other chemical or organic tackifiers (typical rates of 120 to 150kg/ha).

On slopes of 15% or greater, a binding chemical (tackifier) or other suitable anchoring mesh, should be applied to the mulch.

The two main tackifiers used in Australia are:

- cross linked guar—biodegradable, non hard-setting and re-wettable (a product commonly used within the food industry);
- copolymer Poly Vinyl Alcohol (PVA)—more durable than 'guars', hard-setting, but will not re-wet after initial setting.

Psyllium husks and polyacrylamides (PAMs) are less commonly used in Australia.

Guar (guar gum) tackifiers:

Guar tackifiers should consist of a minimum of 95% guar gum by weight; the remaining shall consist of dispersing and cross-linking additives. These tackifiers are generally preferred on mild slopes during periods of low rainfall.

The advantage of guar tackifiers is their excellent flow characteristics making their application by hydromulchers easier. They are completely biodegradable and do not restrict the emergence of plant shoots even when they have dried to a soft crust.

The main disadvantage of guar is that they can 're-wet' and lose their strength following rainfall or sustained plant watering.

Typical application rate is 55kg of dry adhesive mixed with a minimum of 280kg of recycled newsprint as a tracer, and 12,200L of water applied per hectare.

Copolymer PVA tackifiers:

PVA tackifiers are generally considered better when applied on steep slopes. Their main disadvantage is that they may adversely affect emerging shoots due to their hard-setting nature.

Copolymer PVAs are probably not as environmentally friendly compared to guar, but they are a lot more durable (i.e. do not 're-wet'). Their main advantage is their holding strength when applied to mulches on steep slopes, and mulches applied during periods of high rainfall. Their main disadvantage is that they form a crust that can restrict the emergence of plant shoots.

Typical application rate is 110kg of dry adhesive mixed with a minimum of 280kg recycled newsprint as a tracer, and 12,200L of water applied per hectare.

Latex-based tackifiers:

The recommended composition, by weight, of a latex emulsion polymer tackifier is 48% Styrene, 50% Butadiene, and 2% additive; 42.0 to 46.0% solids; and a pH, as shipped, of 8.5 to 10.0. The emulsion should not be allowed to freeze or to be exposed to sunlight for a prolonged period of time.

Typical application rate for latex-based tackifiers is 140L of latex-based adhesive mixed with a minimum of 280kg of recycled newsprint as a tracer, and 3500L of water applied per hectare.

Other tackifiers:

Other potential tackifiers include water soluble natural vegetable gums or guar gums blended with gelling and hardening agents, or a water soluble blend of hydrophilic polymers, viscosifiers, sticking aids, and other gums.

Table 1 – Example of guar gum based tackifiers

Products	Manufacturer
Lawn Tack	Amturf Seeds
Second Nature Tacpac GTX	Central Fiber Corp.
Landtack	Erosion Control Technologies
Eco Tak-OP	Eastern Products Inc.
Finn A500 Hydro-Stik	Finn Corporation

Table 2 – Example of hydrophilic polymer tackifiers

Products	Manufacturer
Exact-Tac (E-T)	American Excelsior Co.
Con-Tack A/T	Con Wed
Eco Tak-SAT	Eastern Products Inc.

Table 3 – Example of latex based tackifiers

Products	Manufacturer
BUTOFAN NS 268	BASF Corp.