Laundry Detergents

What did we test?

Lanfax Laboratories purchased laundry detergents from supermarkets in Armidale, NSW (during late 2004, early 2005) and a few samples were supplied, without charge, by various individuals to total 54 powders and 41 liquids.

Samples of each of these products were mixed at two rates: one specifically for front loading washing machines (75 L); and one for top loading washing machines (150 L) to simulate the full washing cycle (wash, spin rinse, deep rinse, spin dry).

The rates of detergent were calculated from weighed samples of a known volume from a freshly opened packet and mixed at the manufacturer's recommended dose for a normal wash.

The samples were mixed with rainwater at the chosen dose and agitated for 30 minutes to replicate washing action. Samples were tested within one hour for pH and salinity. Other tests followed normal good laboratory practice.

Why carry out the tests?

The quality of greywater from domestic dwellings is a cocktail from the numerous chemicals used in the home for personal and general cleaning. Perhaps the greatest use of chemicals is in the laundry where modern detergents are used at rates from a teaspoonful per wash to one and a half cups per wash. Manufacturers have their own formulations and marketing strategies that mostly fail to address the problem of potentially hazardous chemicals. The impacts of pH, salinity, sodium, phosphorus and sulphur are not addressed in advertising. Most product labels don't even state the ingredients, so astute purchasers can never be sure what is actually in the product. More importantly, very few even let you know how many washes in a packet. This research set out to address some of those shortcomings.

These data are not an endorsement of any product. Lanfax Labs has a policy of not endorsing or degrading any product.

There are no "safe in septic" standards or acceptable guidelines and no laundry product should be called "environmentally friendly".

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Commercial and Research Laboratories with special expertise in

Domestic On-site Sewage Treatment
Greywater reuse
Effluent irrigation
Wastewater treatment
Environmental Monitoring
Soil and Landscape Assessments
Environmental Engineering

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NOTE: Product formulations may have changed since this research was undertaken. Lanfax Labs has no way of knowing which products may have changed and manufacturers have no requirement to advertise formulation changes to the public.

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Proficiency tested by Aust. Soil & Plant Analysis Council Inc

Laundry Detergents

Research Results

Top Loading & Front Loading Liquids & Powders

Figure LF5-Na&P Laundry Liquids - Front Loading
Full wash cycle = 75 L

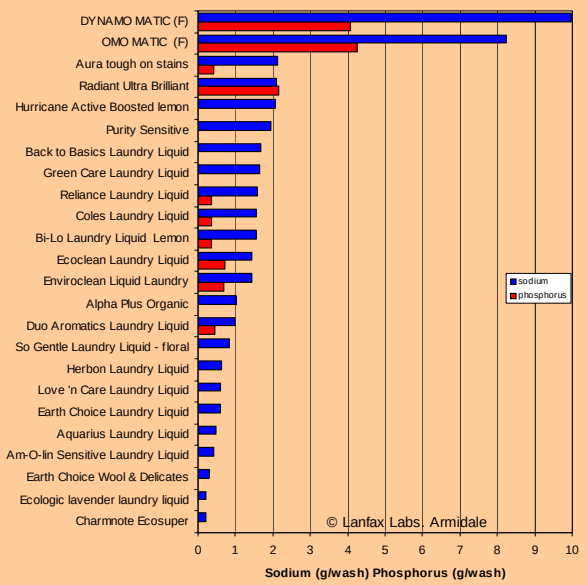
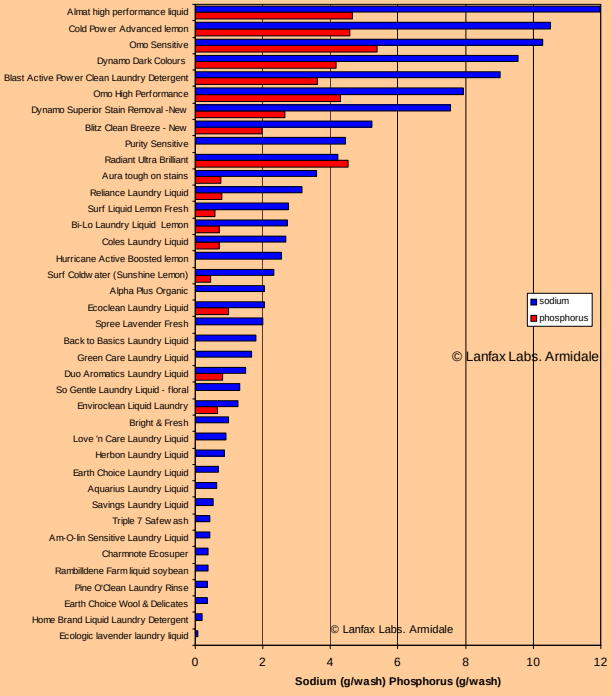


Figure LT5-Na&P Laundry Liquids - Top Loading
Full wash cycle = 150 L



How to interpret the results

The graphs shown on these pages are examples of the numerous graphs available on the website.

Greywater pH

pH is a measure of the acid or alkaline status of the liquid. Acids have a pH <7, while alkaline solutions have a pH>7. Natural systems prefer pH between 6 and 8.

High pH causes soil to disperse and where greywater is used for landscaping, a high pH may be detrimental to both the plants, soil microbes and the soil structural stability.

Sodium (symbol Na)

Sodium is an element that is essential for all life. However, sodium in elevated concentrations leads to serious plant water stress and potential structural instability in soil. Laundry detergents that contain more than 20 mg sodium per wash may be detrimental to plants and soil structure. In the figures F5 and T5, the lower the sodium the better. Take care with products above 20 g/wash.

Figure F5-Na-P Laundry Powders - Front Loading
Full wash cycle = 75 L

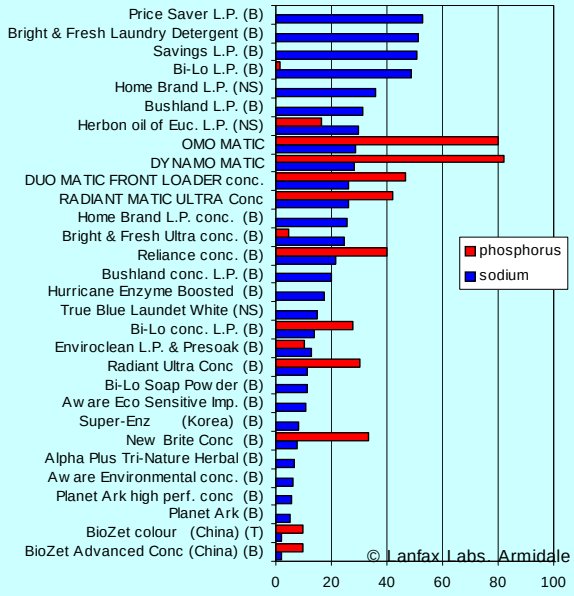
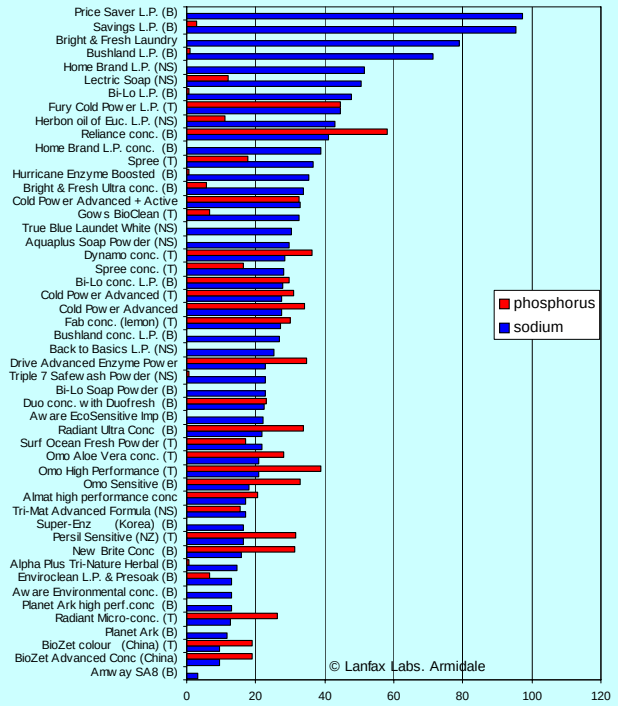


Figure T5- Na-P Laundry Powders - Top Loading
Full wash cycle = 150 L



Phosphorus (symbol P)

Phosphorus is an essential biological element and a non-renewable resource. It is an excellent component of modern detergents, but detrimental when discharged into waterways as it encourages growth of algae and bacteria ("blue-green algae"). When greywater is used for landscaping, plants can uptake the P and so reduce the need for P from other fertilisers. On sandy soils P may leach into groundwater. With care on heavy clay soils much of the P may be locked up in the soil and not be an environmental problem.

If your greywater system may impact on a sensitive environment, you need to choose a product with a very low P. The "P" symbol on the packet is not a good indicator as some products marked "P" have relatively high levels of P. The "NP" symbol is a good indicator of extremely low (almost absent) P.