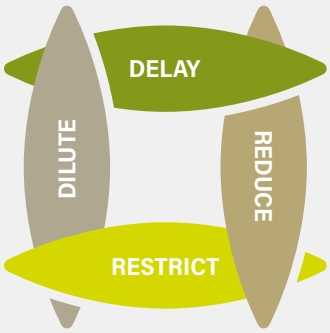


1. DILUTE

Increased urine volume. Reduced N concentration. **Ecotain** environmental plantain increases the volume of urine animals produce, which means the N being excreted is in a more dilute form, resulting in a reduced N load in the urine patch.

2. REDUCE

Reduced total N in urine. Reduced N concentration. **Ecotain** reduces the amount of dietary N which is excreted in urine, compared with ryegrass. This reduces the amount of N released into the soil via the urine patch.

3. DELAY

Slow release from ammonium state. Greater plant uptake. In urine patches from animals grazing **Ecotain**, the conversion from ammonium to nitrate is delayed. Slower conversion allows plants a greater opportunity to uptake N, significantly reducing the potential for leaching.

4. RESTRICT

Restricts nitrification rate in soil. Reduced N leaching. The presence of **Ecotain** plants in the soil reduces nitrification, likely through the effect of a biological nitrification inhibitor.

An Environmental Breakthrough in Nitrogen Mitigation

THE POWER OF 4

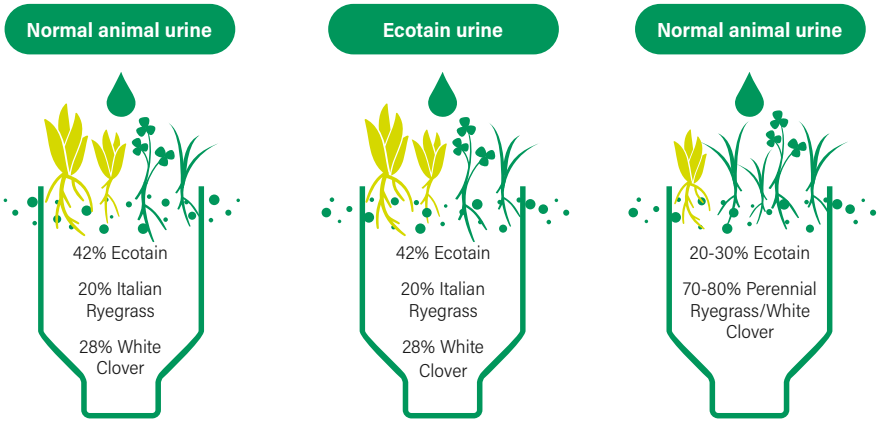
Ecotain® environmental plantain has been shown to reduce nitrogen leaching from the urine patch. Lincoln University lysimeter studies showed a reduction in nitrogen leaching by 89% from the urine patch compared with ryegrass and white clover. The diagram to the left demonstrates the four mechanisms working together.

ENVIRONMENTAL FUNCTIONALITY

Research has demonstrated that not all plantains (current cultivars or breeding lines) are capable of reducing nitrate leaching from the urine patch through the four mechanisms that **Ecotain** can – dilute, reduce, delay and restrict. In all other agronomic aspects as well as environmental, **Ecotain** is an excellent example of a high quality, productive forage plantain.

Figure 15 represents the outcome of a lysimeter study which demonstrated a 45% reduction in leaching when urine from animals grazing normal pasture (ryegrass/clover) was applied to an **Ecotain** mix. This is the RESTRICT function at work. When urine from animals grazing the Ecotain mix was applied to the same sward, a reduction in leaching of 89% was recorded*, this second lysimeter demonstrates all four mechanisms working together. The third lysimeter demonstrated a 74% reduction in leaching when urine from animals grazing normal pasture was applied to a mix containing just 20-30% **Ecotain**. This suggests that moderate rates of **Ecotain** can be extremely effective at reducing N leaching.

Figure 15. Nitrate leaching reductions using different urine and pasture mix treatments from lysimeter research



45% less leaching* *(Woods, 2017 used with permission)*

89% less leaching* *(Woods, 2017 used with permission)*

74% less leaching* *(Carlton et al., 2018)*

*From the urine patch. Compared to control ryegrass/white clover pastures.