

# Overseer Frequently Asked Questions

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## What is Overseer?

- Overseer is an agricultural management tool, which helps farmers and growers make better farm management decisions to improve their farm's environmental sustainability and productivity.
- Overseer is made up of a set of science models and components that work together to model nutrient flows including greenhouse gas emissions for a farm system.
- Overseer provides a way to estimate how nutrients are cycled within a farm system. The model assumes that the farm system is stable (a quasi-equilibrium exists), estimating nutrient transfers averaged over the long term, and not dependent on the previous year's activities.
- It generates nutrient budgets for seven key farm nutrients that estimate the amount of nitrogen (N) leaching at the root zone and phosphorous (P) surface run-off. It also models the amount of methane, nitrous oxide and carbon dioxide generated on-farm and the amount of carbon sequestered in trees.
- Overseer uses a blend of empirical and mechanistic models and is drawn from a large body of **peer reviewed scientific experiments**.
- The model allows the user to better understand annual average nutrient requirements and the likely effects of changing management practices on the farm's overall nutrient inputs and losses.

## Who owns Overseer?

- Since the 1990s, the Fertiliser Association of New Zealand has partnered with MPI and AgResearch on the development of Overseer. This has led to the development of the current Overseer Owners Agreement.
- The objective of each party in this agreement was clear—to develop Overseer to be 'the trusted on-farm strategic management tool for achieving optimal nutrient use for increased profitability, and managing nutrient use within environmental limits'.
- Overseer Ltd was jointly established to accelerate development of the tool.
- Establishing a partnership approach to development of the model was intended to create trust.
- Having the regulator, the national science organisation and industry in the partnership brings robustness and credibility to Overseer. It means that the three parties are committed to working together to deliver a tool that works for farmers.

## Who is the target audience for Overseer?

- Overseer seeks to make the best use of New Zealand science and apply it in a context that is useful to the farmer and their adviser.
- Farmers and farm advisers can combine their real-world experience to verify outputs.
- Overseer is not intended to be a research model run by scientists.

### **How do farmers use Overseer?**

- A nutrient budget tells a farmer how much is coming in and how much is going out and to where. Farmers use Overseer to see:
  - how efficiently nutrients are being used on a farm
  - expected nutrient and greenhouse gas losses to the environment
  - the likely impacts of changes in farm management practices or farm systems.
- It is a long-term annual average model that is intended to support forward-looking decision making for a representative farm system.

### **What is Overseer's role in ensuring farmers comply with government regulations?**

- As compliance with regional councils' regulations becomes more challenging, farmers and their advisers and consultants use Overseer to assist with nutrient budgets, nutrient management and scenario planning.
- The Overseer model has been used by farmers to manage nutrients well by understanding the likely impact of proposed farm system changes on nutrient cycling. This includes understanding of potential nutrient loss.
- This has been core to managing the potential impacts of agriculture in New Zealand's effects-based regulatory regime, which focusses on the impacts of the proposed operation of a farm system.

### **What is the Fertiliser Association's interest in Overseer?**

- From an industry perspective, our interest in Overseer has been about using the best of NZ science to give farmers confidence in making good decisions on nutrient management.

### **Why do the fertiliser companies use it?**

- Overseer is used by companies as a key decision support tool when assisting shareholders with nutrient budgets, scenarios and environmental mitigations planning.

### **How does a model like Overseer benefit New Zealand's agricultural sector?**

- Overseer is a useful model to help us think about the farm system, what we can do to improve, and what innovations support improvement management.
- This is the basis of the journey we all need to make so that New Zealand farms can meet both goals for profitability and heightened environmental responsibility.

### **How does the industry review the suitability of Overseer data?**

- Development of the tool has been guided by an independent science panel and has been supported by over one hundred peer reviewed science papers.
- Overseer evolves as new science becomes available. Recent modifications include the incorporation of mitigations such as urease inhibitors, the use of plantain or assessment of carbon sequestration through planting trees.

- A model is necessary because monitoring actual nutrient loss on each and every farm is impractical, guessing is unacceptable and blanket rules on inputs are undesirable.
- The model has been designed so that it uses information, which is directly available to farm managers, supported by default information from national databases.

#### **How accurate is the data in Overseer?**

- We have always been conscious that it is an immense problem to accurately predict the fate of nutrients across the range of climates, soils and farming systems operating in New Zealand.
- Complex simulation models used by researchers will be more accurate in describing what is happening on a single paddock. Unfortunately, such models do not translate to the reality of a farm system where they can be used by the farmers and their advisers who have both the data and the need to use the data to make real decisions.

#### **Why does the Overseer model not provide a 'real-time' loss estimate?**

- It is widely recognised and understood that Overseer is NOT intended to provide a real-time estimate of short-term changes in nutrient cycling in response to changes in management or weather conditions.
- The model must be simple to use otherwise farmers won't use it. The Overseer model shows a comparable estimate to assess the impact of different management approaches.
- The model focuses on the aspects of management that are under a farmer's control.
- There are several models available that can be used to assess nutrient changes in real-time conditions. These are often complex simulation models used in a research context rather than in a farm setting. They rely on substantial amounts of data, information, computing capacity and scientific expertise. This is not available in a typical farm setting. An example is Apsim, which needs a scientist to run the data outputs.

#### **What is the alternative to Overseer?**

- Without a quantitative tool like Overseer that takes into consideration the sensitivity of the environment that individual farms operate in, we must rely on more blunt approaches. For example, regulated practices or input controls.
- Regulated practices and input controls require a lot of work from farmers to implement them but are unlikely to achieve environmental objectives.
- Farmers are unlikely to want to have government specifying how many cows they can have on their land.