Release Notes – Overseer version 6.4.2

Contents

Introduction

OverseerFM model release 6.4.2 addresses defects in model implementation identified by feedback from our users. It also implements changes to specific parameters, reviewed and recommended by subject matter experts, that improve representation of dairy goats in the Overseer model based on the latest information available.

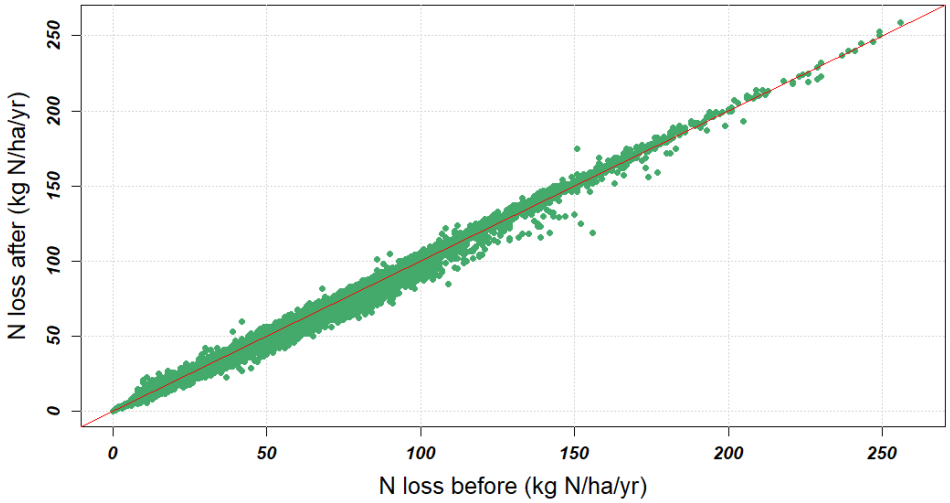
These release notes detail the changes which have been made and the impact of those changes on N, P and GHG results at the farm level.

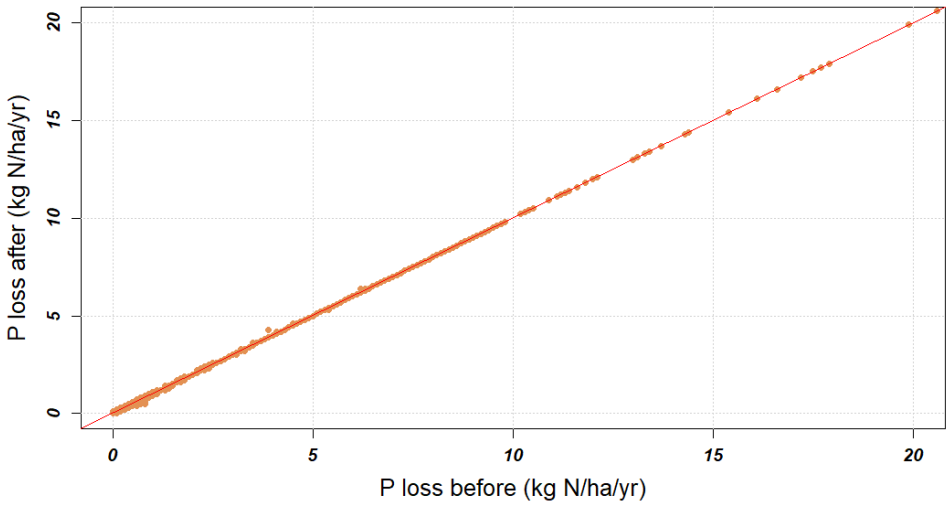
Before releasing model updates to OverseerFM each individual change is assessed independently and all changes were reviewed and agreed by subject matter experts (AgResearch).

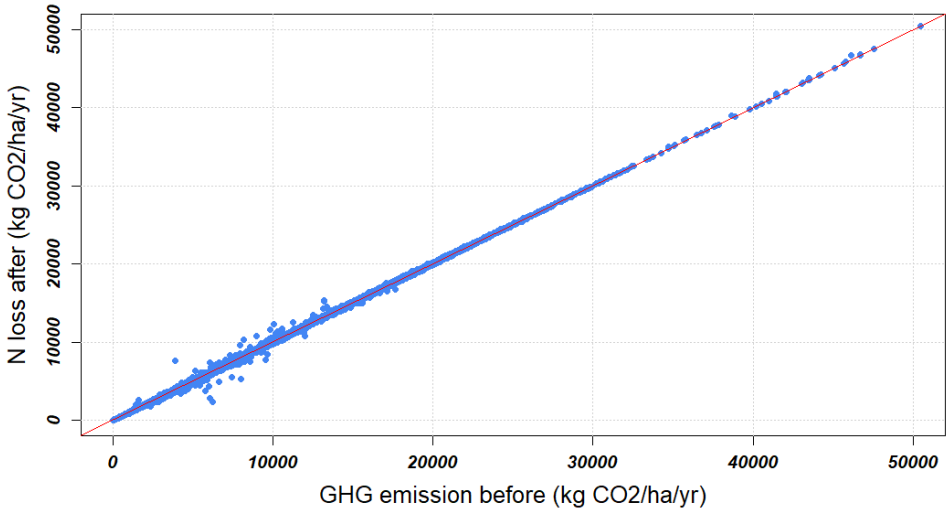
The impact on modelled results for each change is determined collectively and individually using year end analyses for each farm account in OverseerFM. The impact of the collective and individual changes are outlined below.

Overall impact

The following graphs show the combined impact of model release 6.4.2 on N, P and GHG results. We have used the complete database of 94,000 analyses within OverseerFM.







Individual changes

The following sections detail the individual changes made and present the impact on N, P and GHG results. For these assessments we have used only the latest year-end analyses for each farm account.

1. Animal conversion changes

The following changes have been made to the way we convert animal inputs into animal data used in the model and how the model defines weight gain.

Details of the equations used to model animals in Overseer are set out in the Characteristics of Animals technical manual.

Weaning

There is a weaning date and weight on the enterprise, but each mob also defines a weight and month via weaning events.

If a mob defines the weaning date and weight, this will be used instead of the enterprise date and weight when calculating weight gain.

Weaning date is still used for the lactation length and so should be set as the average date for the enterprise.

Mapping animal events to the model

We have changed the way the software converts events to animal numbers so that the model gives a more accurate reflection of ME requirements each month. The changes made include:

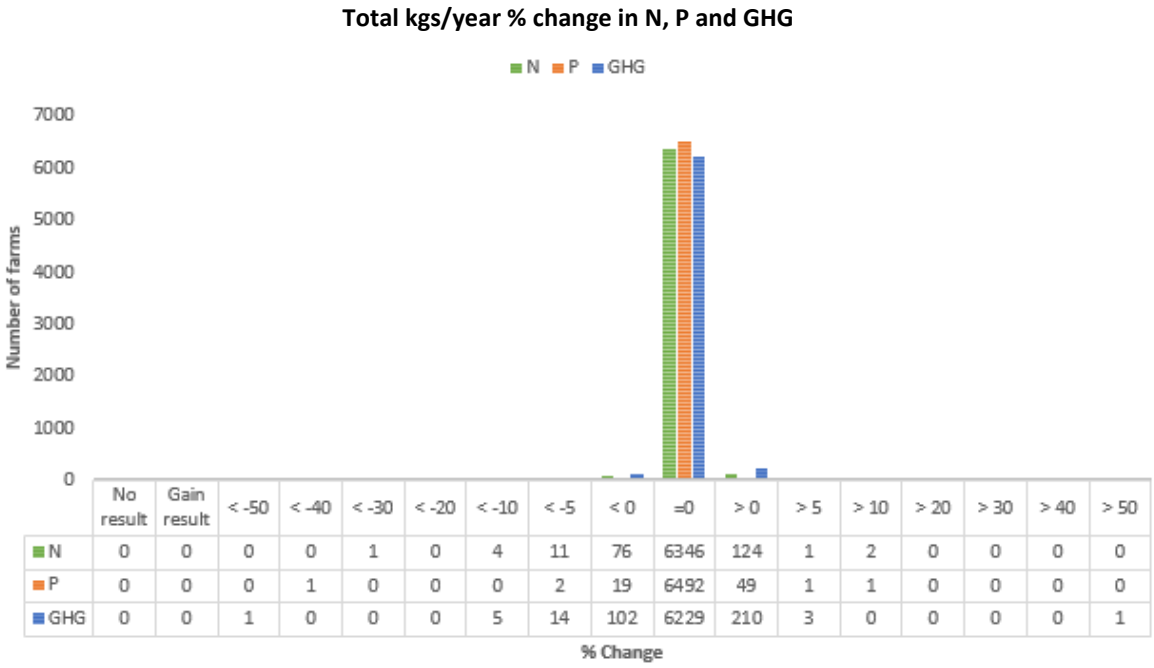
- Any sales of animals will take oldest animals first (animals that have been on farm the longest)
- Improved how days on farm (within a month) are allocated when multiple events occur within a single month. This is done by proportioning animals from the beginning of the month to the sales event for animals sold and proportioning animals from the purchase event to the end of the month for animals brought onto the farm.

- Corrected the problem where selling animals in June did not make use of the end weight for the mob because there were some animals that remained on farm.

Start age

When determining a start age of an animal, when only a start weight was entered by the user, the code was setting the start age to the max age. We have corrected this issue by setting the start age to the start age.

Impact of animal conversion changes



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P	0	0	0	1	0	0	0	2	19	6492	49	1	1	0	0	0	0
GHG	0	0	1	0	0	0	5	14	102	6229	210	3	0	0	0	0	1

2. Dairy goat changes

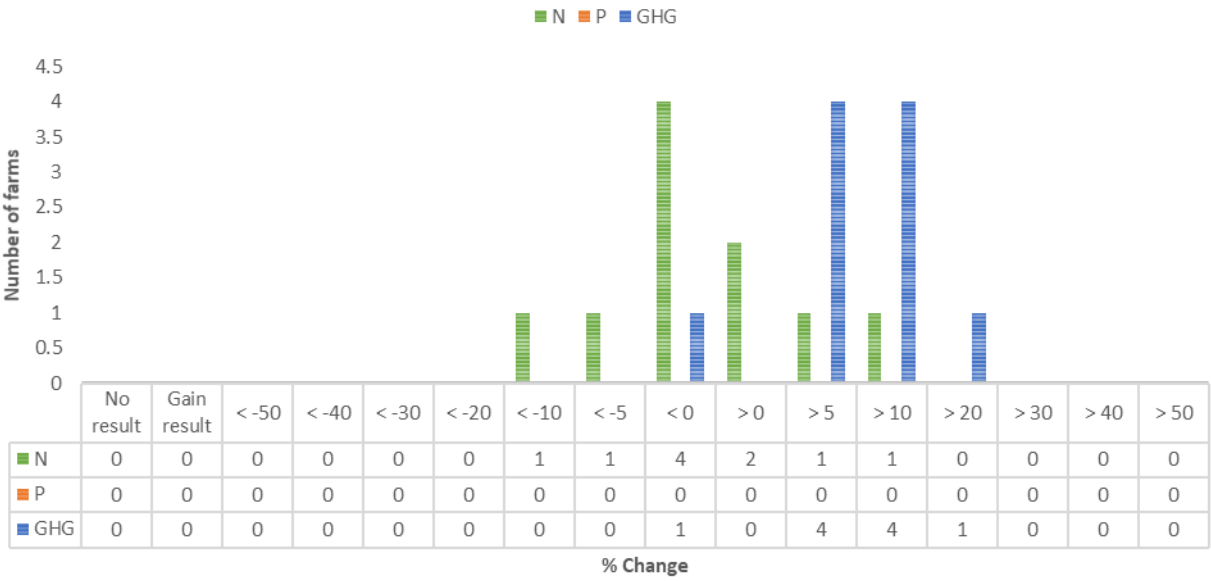
The following changes have been made based on a review of the dairy goat metabolisable energy (ME) model by AgResearch and undertaken in collaboration with the Dairy Goat Co-operative:

- Updated mature weight, birth weight, weight gain, buck weight and dressing out percentage
- Updated birth rate, weaning rate, survival rate and replacement rate. Also updated gestation length.
- Updated milk composition, energy formula for milk and lactation length.
- Updated default birth date, age removed and weaning age
- Updated nutrient concentrations of animals
- Fix bug when calculating nutrients from leftovers
- Change default feed waste from 40% to 17%. Also force user to select how leftovers are used.

Impact

The following shows how dairy goat farms are impacted by these changes. Farms that have no change have been removed so it is easier to see how the remaining farms are affected.

Total kgs/year % change in N, P and GHG



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P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GHG	0	0	0	0	0	0	0	0	1	0	4	4	1	0	0	0

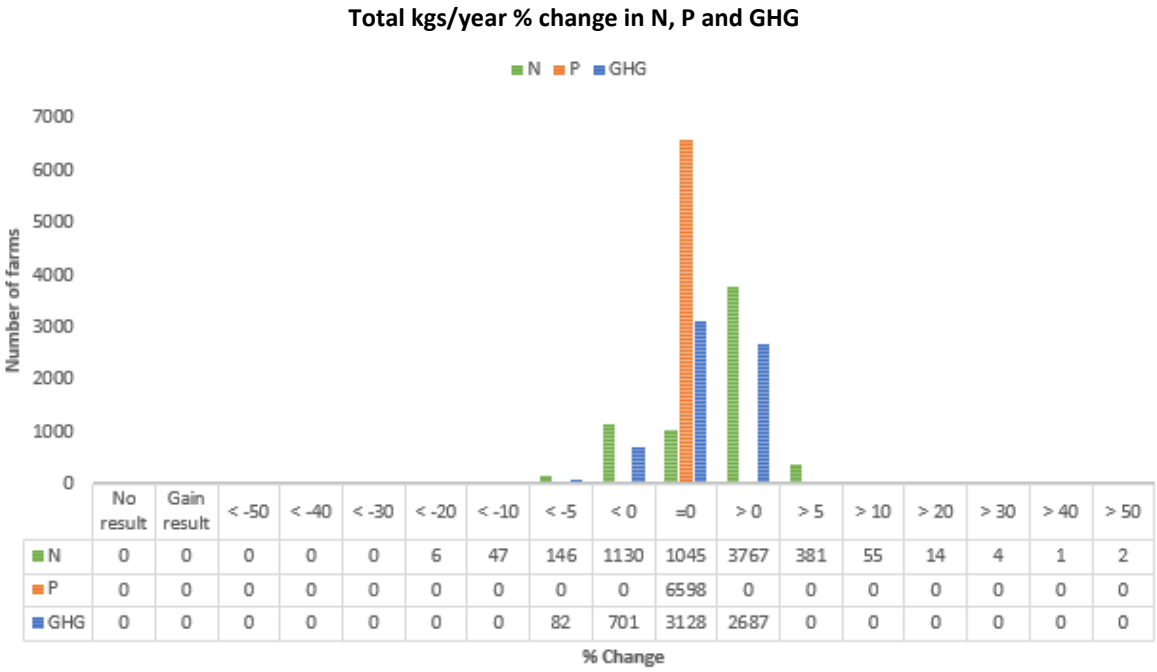
3. Nitrogen concentration in pasture

Some issues have been found with the implementation of equations 6, 9 and 10 of “Characteristics of pasture” technical manual for nitrogen concentration in pasture. From these equations, the base concentration gets adjusted based on a factor using one of slope, pasture type, stock type or soil moisture.

For blocks that have steep slopes the factor used to adjust the base nitrogen concentration of the pasture is now correctly using 1.1. This has a reasonably large impact on those blocks.

Impact

A small number of farms have large changes. This is because those farms have blocks defined as steep.



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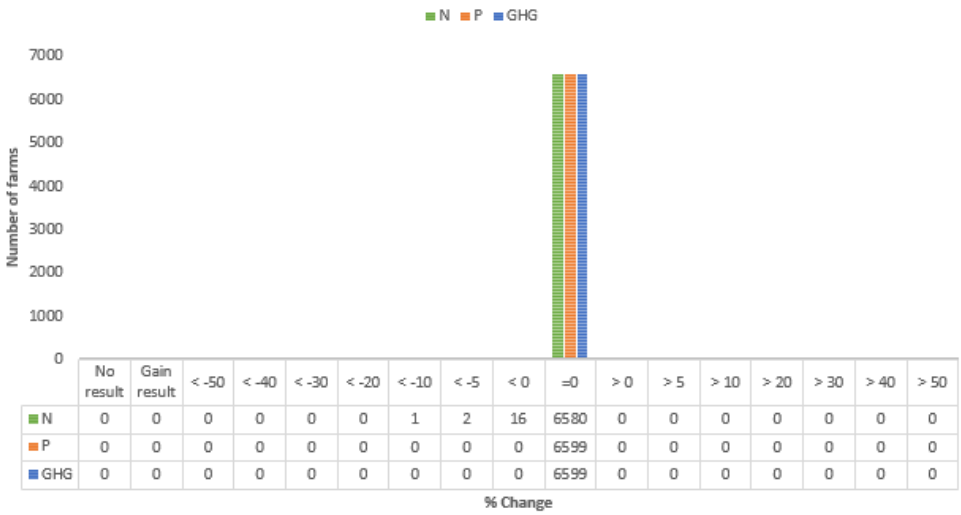
N	0	0	0	0	0	6	47	146	1130	1045	3767	381	55	14	4	1	2
P	0	0	0	0	0	0	0	0	0	6598	0	0	0	0	0	0	0
GHG	0	0	0	0	0	0	0	82	701	3128	2687	0	0	0	0	0	0

4. Conversion of organic fertiliser rate not allowing for fodder blocks

When organic fertiliser is entered as total tonnage applied (not a rate) it gets converted to kg/ha so it can be allocated across multiple blocks. This did not account for fodder block areas that are rotating through pasture blocks. This has been corrected so that the fodder block areas are included.

Impact

Only 19 farms changed, 16 of those by less than 5%.



	No result	Gain result	< -50	< -40	< -30	< -20	< -10	< -5	< 0	=0	> 0	> 5	> 10	> 20	> 30	> 40	> 50
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P	0	0	0	0	0	0	0	0	0	6599	0	0	0	0	0	0	0
GHG	0	0	0	0	0	0	0	0	0	6599	0	0	0	0	0	0	0

5. Monthly urine settings not reset between months

A bug was found whereby monthly leaching, volatilisation and denitrification values were not reset between months when calling the urine patch model. When there were months without deposited urine (these cases are very rare); monthly values were not properly reset. Now, the values are correctly reset at each run through the model.

Impact

No impact, simply used for monthly reporting.

6. Pasture production not reset for months that have no animals

A bug was found where there are animals grazing crops for multiple months of the year, the model was not resetting DM on those months and so was over estimating DM produced in some very rare cases. This has been corrected.

Impact

No impact.

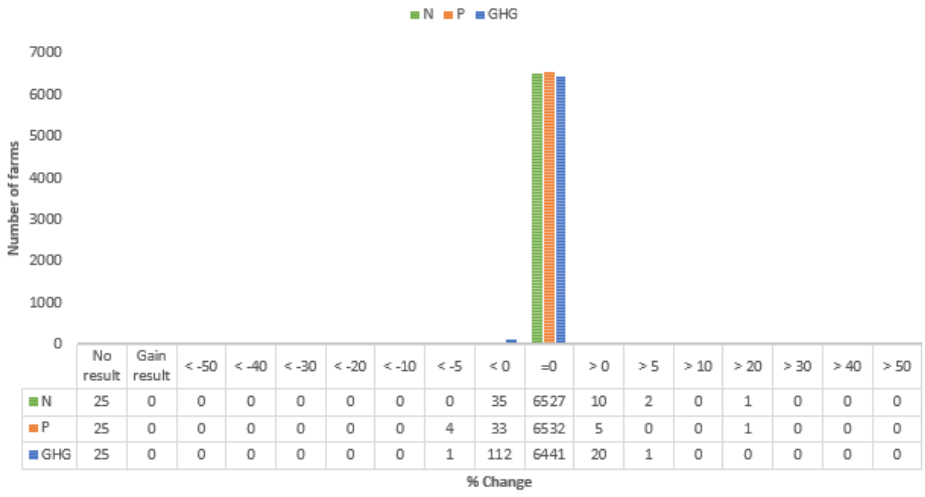
7. Double counting birth rate

When calculating ME from pregnancy the birth rate was incorrectly multiplied by the energy requirements twice. This has been corrected. A description of the energy requirement can be found in "Animal metabolisable energy requirements" technical manual.

Impact

Analyses with animals with a birth rate other than 1 such as beef, dairy goat and deer could be impacted.

Total kgs/year % change in N, P and GHG



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P	25	0	0	0	0	0	0	4	33	6532	5	0	0	1	0	0	0
GHG	25	0	0	0	0	0	0	1	112	6441	20	1	0	0	0	0	0

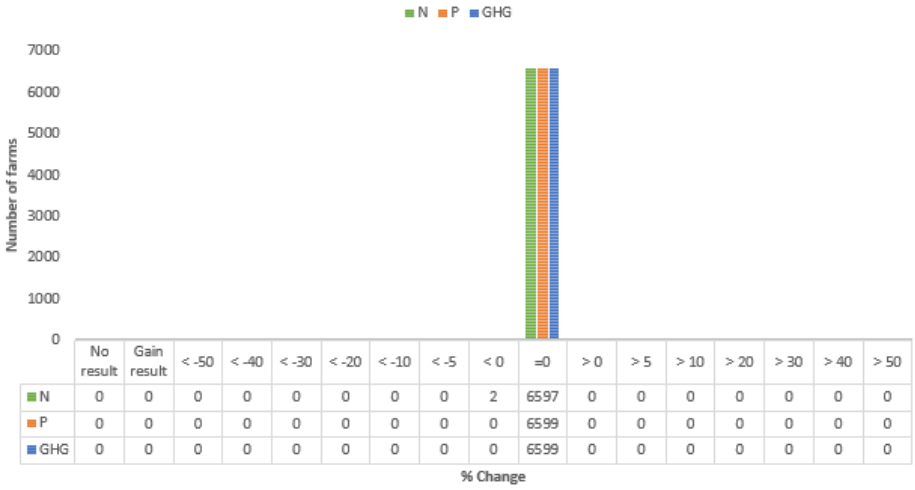
% Change

8. Months after crops removed not used for root vegetables

Root vegetables have an option to enter the number of months after harvest that the crops are removed. A bug was found whereby this option was not correctly transmitted within the model. The bug has now been corrected and this feature will now correctly distribute the nutrients across those months.

Impact

Total kgs/year % change in N, P and GHG



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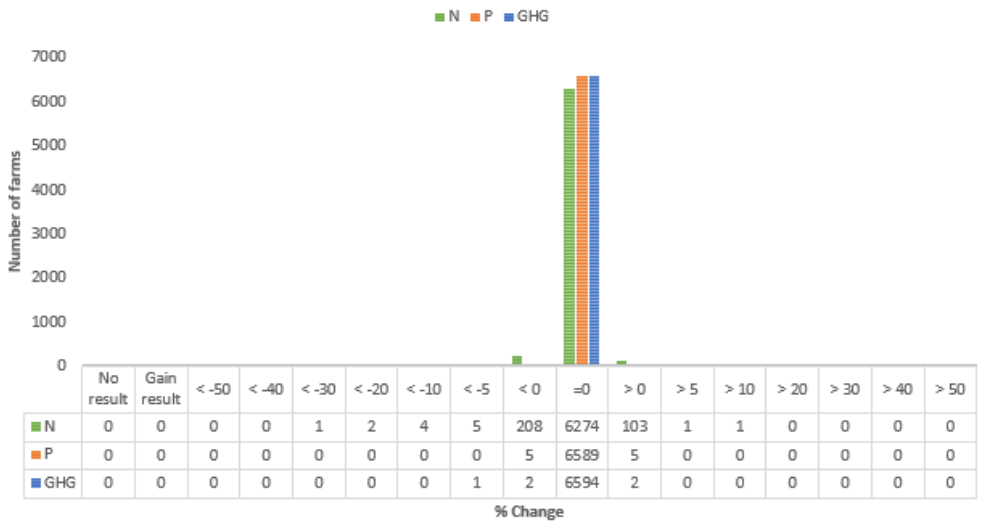
P	0	0	0	0	0	0	0	0	0	6599	0	0	0	0	0	0	0
GHG	0	0	0	0	0	0	0	0	0	6599	0	0	0	0	0	0	0

9. Animal supplement distribution

Corrected inconsistencies in the way the software was distributing supplements with and without monthly feeding entered.

Impact

Total kgs/year % change in N, P and GHG



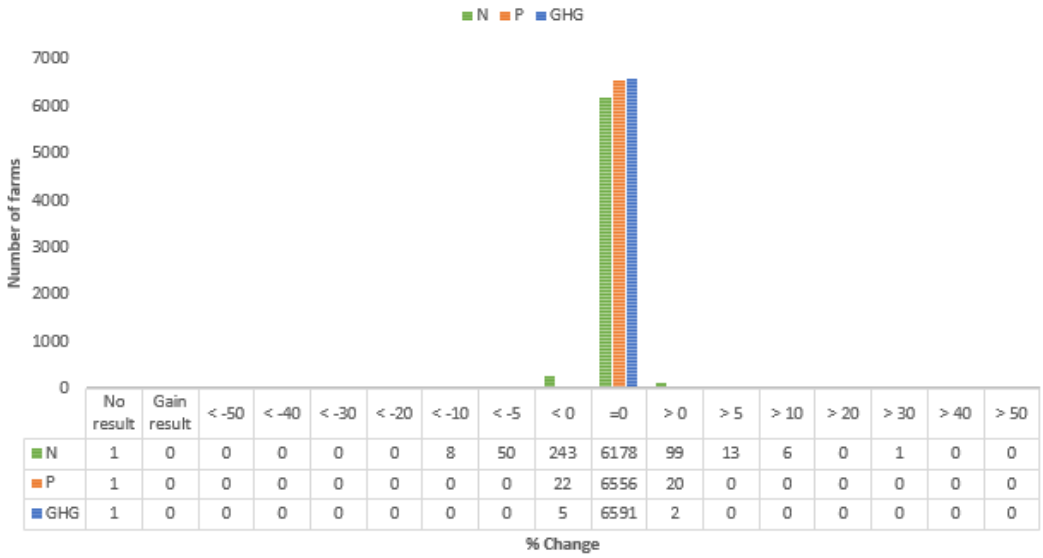
	No result	Gain result	< -50	< -40	< -30	< -20	< -10	< -5	< 0	=0	> 0	> 5	> 10	> 20	> 30	> 40	> 50
N	0	0	0	0	1	2	4	5	208	6274	103	1	1	0	0	0	0
P	0	0	0	0	0	0	0	0	5	6589	5	0	0	0	0	0	0
GHG	0	0	0	0	0	0	0	1	2	6594	2	0	0	0	0	0	0

10. Distribution based on animals present

A bug was found whereby when a user entered animal distribution as “based on animals present, the model proportioned the animals as if they were on all blocks all year round, even for crop blocks where the animals should be grazing only part of the year. Consequently, this over allocated animals on crop blocks in the months they were there. A complete description of the distribution methods can be found in “Interblock Distribution” technical manual.

Impact

Total kgs/year % change in N, P and GHG



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N	1	0	0	0	0	0	8	50	243	6178	99	13	6	0	1	0	0
P	1	0	0	0	0	0	0	0	22	6556	20	0	0	0	0	0	0
GHG	1	0	0	0	0	0	0	0	5	6591	2	0	0	0	0	0	0

% Change

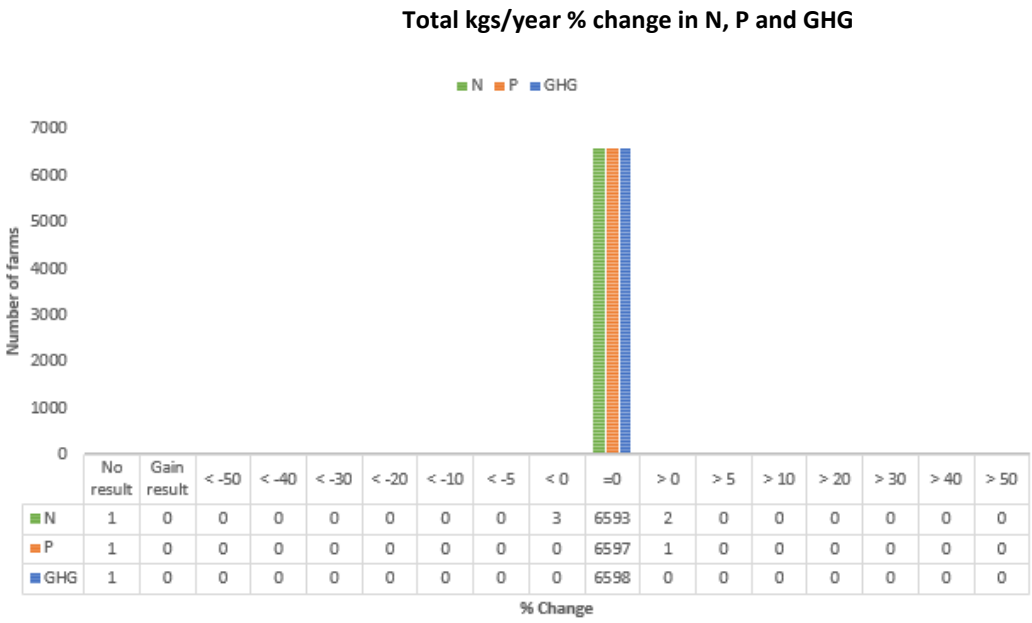
11. Supplements not allocated based on month

A bug was identified that where a farm had a large number of animals in one month compared to another month and supplements were fed to those animals, the supplement was proportioning based on the annual total animal number rather than based on each month. The correction allows better consideration of the monthly number of animals and therefore corrects side effects when there is a very large difference in the number of animals between months.

The description of the timing of supplement can be found in section 6 of “Supplements” technical manual.

Impact

Very low impact



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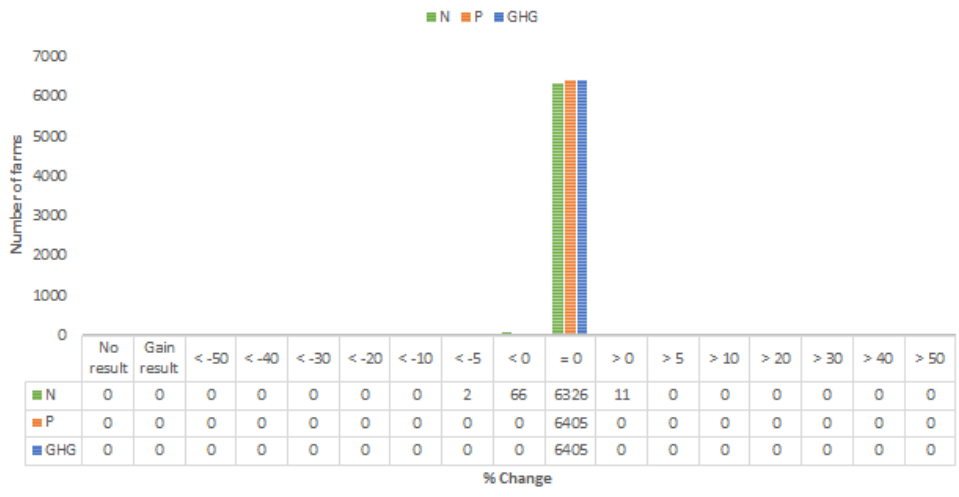
N	1	0	0	0	0	0	0	0	3	6593	2	0	0	0	0	0	0
P	1	0	0	0	0	0	0	0	0	6597	1	0	0	0	0	0	0
GHG	1	0	0	0	0	0	0	0	0	6598	0	0	0	0	0	0	0

12. Fix yield calculation for annual ryegrass

Calculation for annual ryegrass crop yield (equation 35 of “Characteristics of pasture” technical manual) was incorrectly implemented. It has now been corrected.

Impact

Very low impact



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N	0	0	0	0	0	0	0	2	66	6326	11	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	6405	0	0	0	0	0	0	0
GHG	0	0	0	0	0	0	0	0	0	6405	0	0	0	0	0	0	0

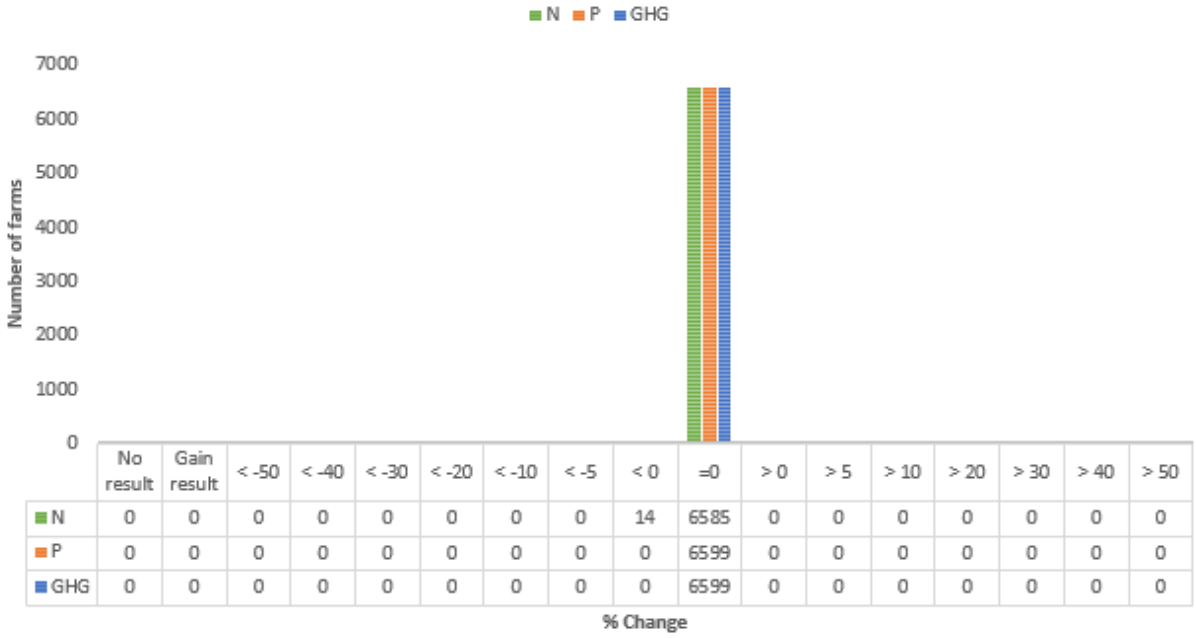
13. Fix to the total daily water added

Calculation for the total water added (Equation 21 of the "Hydrology" technical manual) was implemented differently in the drainage and crop sub models. This has now been corrected.

Impact

Very low

Total kgs/year % change in N, P and GHG



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N	0	0	0	0	0	0	0	0	14	6585	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	6599	0	0	0	0	0	0	0
GHG	0	0	0	0	0	0	0	0	0	6599	0	0	0	0	0	0	0

14. Fix to the aviation fuel calculation

The aviation fuel calculation (Equation 47 of "Carbon dioxide, embodied and other gaseous emissions" technical manual) was incorrectly implemented. It has now been corrected.

Impact

No change