

Weather Forecast Accuracy : Part 1 Rainfall

Andrew Hodson
HortPlus
andrew@hortplus.com

A question I am often asked is “How accurate are your forecasts?” Verifying the accuracy of weather forecasts is very, very hard. Exactly what you compare with what is open to debate. In this article we have looked at about 20,000 hourly forecasts used in HortPlus Metwatch Online system and produced by the Met Service. The forecasts were produced at 11 am each day and cover the years 2004,2005,2007 and January to March 2008. I don’t know what happened to 2006. Perhaps we were not saving forecasts then. The saved forecasts include the 14 day text forecast and the frost outlook but they will be covered in future articles.

The comparison of actual versus forecast rain across the country is shown in figure 1. To get here I have simply summed the rain forecast and compared it with the rain that actually fell during that period.

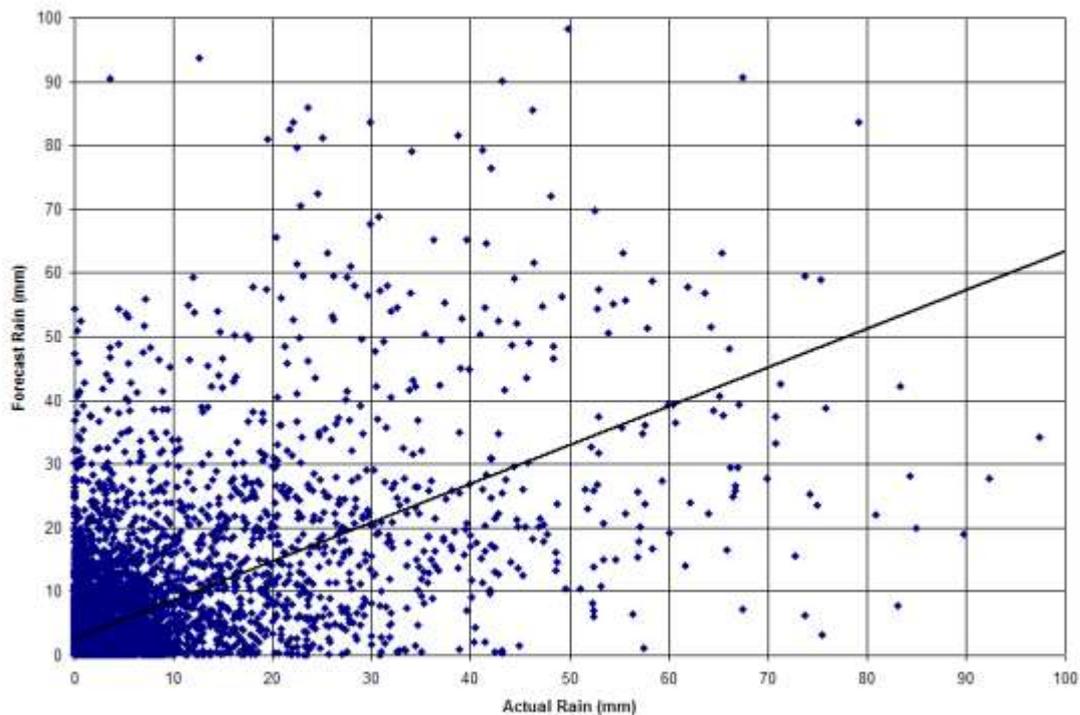


Figure 1 : Actual versus forecast rain

The figure shows that generally the rain forecast actually fell but the amount that fell was difficult to predict. If we look closer at the data and examine heavy rain events of more than 10mm some interesting trends emerge. Heavy rain not being forecast is a rare event. About 0.24% of the time or about once every year. A heavy rain forecast and no rain arriving is more common. About 1.27% of the time. More on that later. If anything there is an over forecast of heavy rain.

Table 1 shows a comparison by region between actual and forecast rainfall. The forecast amount of rain is about right for every district except the Waikato region and Nelson/Central Otago. In Waikato, Nelson and Central Otago the forecast is a bit high.

Table 1 : A comparison of rainfall by region

Region	Actual Rain	Forecast Rain	Accuracy
Northland	7.8	7.5	About right
Auckland	12.7	8.2	About right
Bay of Plenty	6.9	7.8	About right
Waikato	5.9	11.2	Over predict
Poverty Bay	5.6	6.5	About right
Hawkes Bay	4.8	5.2	About right
Central Hawkes Bay	5.3	5.8	About right
Wairarapa	4.9	5.3	About right
Nelson	5.4	8.6	Over predict
Marlborough	3.1	4.4	About right
Canterbury	3.2	3.8	About right
Central Otago	2.4	6.6	Over predict

Forecasting showers must be a nightmare. Whether a cloud will or won't cause rain must be hard to predict ahead of time. According to this set of data, a forecast of showers producing showers or heavy rain occurred 67% of the time. That means that on roughly 1/3rd of the time a forecast of showers failed to produce any rain. There were differences between regions with Hawkes Bay on top with 80% correct and the worst was 53% in Marlborough.

The topic I haven't tackled yet is the timing of when rain fell. Anecdotally it seems pretty good. We get lots of feedback from clients of Hortplus products saying its spot on. My wife Lesley and my dad John base their day on the timing of the rain forecast. I have had a look at the odd occasion heavy rain was forecast but nothing shows up in the actual data during the forecast period. This happened on 13th May 2005 in Katikati. The forecast was for 54.1mm but nothing appeared in the rainfall data. The forecast period ended at 4:00 pm on May 15th but starting at 9:00 pm on May 15th we had 21.9mm of rain. Not really fair to discount this.

So to answer the question "How accurate are your forecasts?" I can make these comments.

1. Heavy rainfall of greater than 10mm is unlikely to be missed.
2. Sometimes heavy rain doesn't fall when forecasted to. About once every 100 forecasts but the heavy rain may fall soon after.
3. The forecasts tend to under predict what actually falls (refer to Figure 1)
4. The forecasting of showers is very difficult. About 1/3rd are forecast and never fall. About the same amount fall but aren't forecast
5. The overall accuracy depends on where you live with Hawkes Bay the best. That's just as well because I live here!

Users of HortPlus Metwatch Online will be aware that we use these forecast to predict pest and disease outbreaks. I will look at the accuracy of these predictions in future articles as well as temperature, frost, wind and humidity. I will also look at the accuracy of the 14 day text only outlook. By the way if you want to trial these forecast yourself for free, simply send us an email. We provide forecasts and historical weather data for all of the major horticultural areas.