

1. Data collection

We collect the 4 different weather data, June, July average precipitation, Feb, Sep average temperature, for Alberta, Manitoba and Saskatchewan from 1940 to 2000. Besides, we collect 40 years yield data for these 3 province from 1960 to 2000.

2. Component

Then we use the 60 year monthly weather data to generate 4 corresponding weather distribution which will be used to generate 5000 weather scenarios for Monte Carlo Simulation.

Also, based on weather data, yield data and Graining handling income, we build two regression model, weather to yield model and yield to earning model.

After we get all these component, we are heading to the Monte Carlo Simulation. For each simulation, we generate 4 weather factor, and then get the yield by using weather-to-yield model, after that we get earning by using yield-to-earning model. The last step is that we deduct last year earning as benchmark. We implement the simulation for 5000 times independently, and then we get the 99% 1-year Earning at Risk. For 1999. The Risk number is -17MM.

3. Assumption

Type one:

We assume history will repeat again and again. So we can measure future risk by using historical data.

Type two:

We assume some conditions keep same when we shift the time, like yield of Alberta, Manitoba and Saskatchewan can represent total yield of Canada.

Type Three:

We do the simulations independently.