10. (1.5 points)

National Certification Guidelines developed by Agriculture and Agri-Food Canada (AAFC) provide guidance to actuaries in developing an actuarial certification for an agricultural insurance program.

a. (0.5 point)

Briefly describe the following components of pricing yield-based plans:

- Uncertainty margin
- Self-sustainability load

b. (0.5 point)

Briefly explain the need for both an uncertainty margin and the self-sustainability load in pricing yield-based plans.

c. (0.5 point)

Briefly describe two additional considerations that are required for pricing non-yield-based plans as compared to pricing yield-based plans.

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QUESTION *10*	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE: *B2***
SAMPLE ANSWERS	

Part a: *0.5* point

- Sample Response #1

Uncertainty measure accounts for possible errors in assumptions in the calculation
Self-sustainability load recoups any deficits from past operations

- Sample Response #2

Uncertainty margin is the margin to account for uncertainty in estimates, assumptions, and the model.
The self-sustainability load is to account for the volatility and be able to absorb losses or to add to surplus or eventually be able to absorb losses.

- Sample Response #3

Uncertainty margin: load to account for the limitation in data, assumption, methodologies, and statistical volatility.
Self-sustainability load: load to get a certain surplus level for the fund to survive in adverse scenario.

Part b: *0.5* point

- Sample Response #1

Both are necessary to ensure the program is self-sustainable. Uncertainty creates conservative estimates accounting for the future and the self-sustainability load recovers historical deficits.

- Sample Response #2

Both loads cover different risks so both are required. The self-sustainability load depends on the current level of the surplus while this does not affect the uncertainty load.
Similarly, the factors affecting the uncertainty load don't directly affect the self-sustainability load.

Part c: *0.5* point

- Sample Response #1

How to measure the amount of loss incurred
How to determine whether event has occurred or not

- Sample Response #2

For weather-based plans, would need to consider historical weather conditions and likelihood of a claim
For perennial coverage, need to consider the age/maturity of the perennial plants

- Sample Response #3

Non-yield based plans don't pay out benefits based on production level. It's based on a pre-determined occurrence of an event, may be weather related. ex. 5-days of consecutive raining.
-hence need third party data to estimate the probability of the event occurring
-another consideration is the estimated benefits which will be paid if the event occurs

- Sample Response #4

-models should account for external factor, such as weather (must predict it)
-should demonstrate that the pricing is in line with historical losses or what historical loss cost would have been.

EXAMINER'S REPORT

Candidates did not score very well on this question and very few candidates received full credit.

Many candidates were able to describe the margin and load in part a) but then were not able to describe how both loads were required and non-overlapping. Most candidates reiterated their part a) answer in part b).

Part a

Many candidates received full credit on this part.

Most candidates were able to describe the self-sustainability load, but many candidates were not able to adequately describe the uncertainty margin.

The most common error was describing the uncertainty margin as a load intended to cover the variability in actual yields

Part b

Most candidates did not receive full credit on this part.
Many candidates received partial credit for explaining the need for the self-sustainability load, but were not able to describe how it is needed in addition to the uncertainty margin.

Some candidates received full credit for explaining that the uncertainty margin is needed for short term uncertainty in models, assumptions, and data, whereas the self-sustainability load is required for maintaining long-term program viability through surplus.

No candidates were able to justify their explanation with an example of how both adjustments are required.

The most common error was:

> describing the components (which was part a), but not addressing why both (or either individually) are needed in pricing yield-based plans

Part c
Most candidates did not receive full credit on this part. Many candidates answered part a) and b), but left part c) blank. Most candidates that received full credit responded on the basis of weather-based plans. For those candidates that responded, the most common errors were: • Providing considerations which are not unique to non-yield based plans such as: I. Handling of catastrophes II. Deductibles III. Expenses IV. Large losses V. Limits on yield and or production • Only providing one consideration instead of two