

# Sequence 3 : Representing risk in agricultural economics models

## Unit 1 : Agriculture, a risky activity

# Lesson 22 : Safety First

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## Example – Safety First

$$\text{Max } Z = 450x_1 + 1000x_2$$

with  $x_1 + x_2 \leq 50$

$$25x_1 + 50x_2 \leq 2000$$

$$460x_1 + 2000x_2 \geq 18000$$

$$440x_1 + 500x_2 \geq 18000$$

$$450x_1 + 300x_2 \geq 18000$$

$$430x_1 + 1400x_2 \geq 18000$$

$$470x_1 + 800x_2 \geq 18000$$

$$x_1, x_2 \geq 0$$

**Solution model with no risk**

$$X_1 = 0, X_2 = 40; Z = 40000$$

**Solution model WITH risk**

$$X_1 = 20, X_2 = 30; Z = 39000$$

$$0 \cdot 450 + 300 \cdot 40 = 12000 \leq 18000 \quad !!$$

Pause the slideshow when you reach risque\_base.gms

1) Add the random income calculation equations and check the random income values in the output file

2) Add risk with the Safety-First method.

Take your time !