

Tutorial 01

Agricultural Production Management

Exercise: Choosing a Production System

Mr. Abdallah has 18 hectares of land in a semi-arid region. He must choose between several production systems considering his resource constraints.

- Available capital: 2,400,000 DZD
- Family labor: 4 people × 200 days/year = 800 person-days
- Can hire seasonal workers: 2,000 DZD/person-day
- Bank credit available: 9% annual interest

Production Systems

System	Crop	Area (ha)	Cost/ha (DZD)	Yield (t/ha)	Price (DZD/t)	Labor (d/ha)
A	Wheat	18	70,000	4.5	28,000	8
B	Tomato	18	320,000	28	37,000	18
C (Mixed)	Wheat	10	70,000	4.5	28,000	8
	Tomato	8	320,000	28	37,000	18

Constraints and Risks

- Post-harvest losses: Wheat 8%, Tomato 22%
- Climate risk: Drought probability = 25% → 40% yield reduction

Questions

1. Calculate gross revenue for each system (after post-harvest losses)
2. Calculate net profit for each system
3. For each system, check if family labor is sufficient. If not, calculate seasonal worker days needed and cost
4. Check if available capital is sufficient for each system
5. For systems needing credit, calculate credit amount and total cost with interest
6. Recalculate net profit after credit repayment
7. For each feasible system, calculate: a) Profit per hectare, b) Profit per labor day
8. Calculate net profit for each system in case of drought (40% yield reduction)
9. Calculate expected profit: Expected Profit = $(0.75 \times \text{Normal Profit}) + (0.25 \times \text{Drought Profit})$
10. Considering ALL calculations (profitability, risk, feasibility), which system would you recommend? Justify with 4 quantified arguments