Participant
Packet
B
Probability Exercises 1-3

Exercise 1:

Highest Class III/BFP price:______

Top 1/3 of market begins at what price:______

Average price:______

Low 1/3 of market begins at what price:______

Lowest Class III/BFP price:______

Based on the years 1988 to the current time, record below what you believe is the correct answer.

Exercise 2

Based on the same time period, record below what percent of the time each price you estimated in exercise 1 occurred, e.g., what percent of the time did the top 1/3 price occur. As you consider your answers you may want to think of a 25 cent range of prices with your answers to exercise 1 as the midpoint of that range. For example if your top 1/3 price was $11.00 then answer below what percent of the time you think the 25 cent price range from $10.88 to $11.13 occurred.

Based on your answers in exercise 1, what percent of the time did the 25 cent range around your:

- Highest price estimate occur ______% of the time
- Top 1/3 price estimate occur ______% of the time
- Average price estimate occur ______% of the time
Slow 1/3 price estimate occur __________ % of the time

Slowest price estimate occur __________ % of the time
Exercise 3

Bring your answers to exercises 1 and 2 together in the graph below. Record the lowest, low third, etc. prices you estimated from exercise 1 on the appropriate lines at the bottom of the graph. Next, follow the graph straight up from the lowest price estimate, and record the percent of time the lowest price occurred (exercise 2) by putting a dot at the appropriate percentage level. Do the same for the other price estimates and connect the dots.
What is Risk and Risk Management
What is Risk

Risk exists if there is something you don’t want to happen – having a chance to happen!!!
What is Risk – Take 2

The probability that some event will cause an undesirable outcome on the financial health of your business and/or other business/family goals.
Components of Risk

EVENT
Cause/Source

- Surplus Production
- Hail
- Increasing interest rates
- Odor lawsuit
- Disabling farm accident

Probability of 5%
- Potential Outcome #1 [minor nuisance]

Probability of 15%
- Potential Outcome #2

Probability of 60%
- Potential Outcome #3

Probability of 15%
- Potential Outcome #4

Probability of 5%
- Potential Outcome #5 [catastrophic]
Components of Risk – Undesirable Outcome

Put simply, the Undesirable Outcome is what hurts!

- lower than expected production
- catastrophically lower production
- inability to meet cash flow
- loss of income
- catastrophic loss of income
- loss of life
- loss of buildings & other resources
- loss of health
- inability to get a permit or loan
Components of Risk – **Event** (Cause/Source of Risk)

The **Event** is what caused the hurt:

- weather event
- injury/death of an employee
- neighbors action against you
- surplus production of milk
- widespread poor grain production
- low quality inputs
- divorce or disagreement
- downward slide in general economy
- and countless more!!!
Components of Risk – Probability

**Probability** is a measure of the likelihood that the Risk Event will occur, e.g., 30% chance of rain
Back to the Beginning Exercise

Probability Distribution

Back to the Beginning Exercise

Probability Distribution

25 Cent Range, Midpoints Are Shown
Back To The Beginning Exercise
[Class III/BFP Prices, 1988-December 2002]

Top Third = $12.25     Bottom Third = $11.81
Overall Categories of Risk

- Legal Risk
- Price Risk
- Environmental Risk
- 5 D’s Risk
  - Death
  - Disability
  - Disagreement
  - Divorce
  - Disaster
- Production Risk
- Human Resources Risk
- Relationship/Public Relations Risk
- Financial Risk
Risk Increases the More You Don’t Know

All The Potential Outcomes
The Probability of Occurrence
Cost of a Undesirable Outcome
Said Another Way:
The more you do know and understand about

All The Potential Outcomes
The Probability of Each Outcome Occurring
Cost of Undesirable Outcomes

the better long term risk manager you will be.
What is Risk Management?

Assuring An Outcome
Risk Management is Assuring An Outcome
Five Primary Means of Risk Management

**Reduce**
1. Reduce the probability that the event will occur
2. Reduce the impact if the event does occur

**Transfer**
3. Transfer the cost of an undesirable outcome to someone else

**Avoid**
4. Completely avoid potential events thus providing a zero probability that they will occur

**Do Nothing**
5. Let the risk happen and be ready to bear the consequences.
Price Risk
What Happens to the Distribution When You Have a Floor Price at $10.51?
What Happens to the Distribution When You Establish a Short Fence from $12.05 to 13.58?
Level of Production
Employee Performance
Interest Rates
Personal Injury/Death (you, employee, spouse)
Divorce
Disagreement
Production Risk

Risk: Poor weather event causing the undesirable outcome of lower than expected yields.

Risk Management???

Transfer the cost of the risk via crop insurance

Corn Yields
Production Risk:

**Risk**: of a poor weather event causing the undesirable outcome of lower than expected yields

Risk Management???

Reduce the cost of the risk via spatial location, multiple variety selection, and other cropping practices.
Financial Risk

Risk: higher interest rates causing the undesirable outcome of lower than expected income/cash flow

Risk Management???
Financial Risk

Risk: higher interest rates causing the undesirable outcome of lower than expected income/cash flow

Risk Management???
**Financial Risk**

**Risk:** higher interest rates causing the undesirable outcome of lower than expected income/cash flow

**Risk Management???

- **Transfer the risk via fixed rate loans**
- **Reduce the cost of the negative impact via lower debt financing**
- **Do Nothing**
Human Resources

Risk: Cost of hired labor not showing up or making a mistake causing lower production, injury, or death

Risk Management???

Reduce the Risk via:
- Regular employee meetings
- Training programs
- Well written position descriptions
- Incentive plans
Human Resources

Risk: Cost of hired labor not showing up or making a mistake causing lower production, injury, or death

Risk Management???

Transfer the risk via disability and other insurance
Avoid the risk by not hiring any employees
Environmental Risk

Risk: manure spill causing the undesirable outcome of fines, lawsuits, and loss of income

Risk Management???

Reduce the risk via:
- Education
- Facilities
- Monitoring checks and systems
- Field and manure trt. practices
Environmental Risk

Risk: manure spill causing the undesirable outcome of fines, lawsuits, and loss of income

Risk Management???

Transfer the risk via liability insurance
Disability Risk

Risk: poor health causing loss of income

Risk Management???

Reduce incidence or impact of risk via:
- Annual health exam
- Quit smoking
- Exercise
- Disability Insurance
- Co-Manager
So, I now know what Risk Management is, but how do I do it???
How???

• Step 1: **Be aware**, identify the risks you face.
• Step 2: **Evaluate**:
  – the likelihood that the risk will occur, and
  – how bad the hurt will be if it does occur
• Step 3: **Decide** on how you will address the risk
  – reduce, transfer, avoid, nothing, or some combination
• Step 4: **Implement**
  – What is the most frustrating words used in management??
    Answer: “If I had only ……”
• Step 5: **Control**
  – Monitor to assure that what you said you would do, you did, and that you are getting what you want out of your risk management strategies.
### Prioritizing Which Risks to Address First

<table>
<thead>
<tr>
<th>Probability of Happening</th>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Small</td>
</tr>
<tr>
<td>High</td>
<td>Catastrophic</td>
</tr>
</tbody>
</table>

#### Action if Cost Effective

- **Act if cost effective**
  - Immediate action

#### No Action Required

- **No action required**
  - Action required

Source: Dr. Geoff Benson, North Carolina State University
Risk Management Is An Individual Decision

- No one "right" decision

- The "right" decision depends on the characteristics of the
  - operation and
  - individual decision-maker
Risk vs. Profitability

Risk

Revenue
Your Risk Management Team

- Extension Agent
- Lender
- Broker
- Dairy Consultant
- Nutrition Consultant
- Crop Consultant

- Technical College Instructors
- Input Supply Managers
- Other Producers
- Insurance Agent
- Milk Buyer
- Attorneys