ARE 415: Introduction to Commodity Futures Markets

Lecture 6: Introduction to Basis

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10.15am – 11.30am
Gardner 3214, NCSU

HOUSEKEEPING

- Commodity presentation on Thursday Feb 1.
- Give back Hw #3
  - You are all experts at “Mark-the-Market”. A few made a simple mistake go back and see if you can get the correct answer that I wrote in on your homework. No redo’s necessary.
- Give back Hw # 2
  - Many made the most of the redo opportunity. Some still need to work on #6 and calculating a dollar value for open interest (OI)
  - Value of OI= OI × Price ($/units) × number of units in contract
  - Example: CH2018 OI=789,240 contracts × $3.5650 ($/bu) × 5,000 (bu)
    =$14,068 million
- WSJ highlights—limited on time today but be prepared we might be able to discuss next time—there have been some interesting articles past few days!

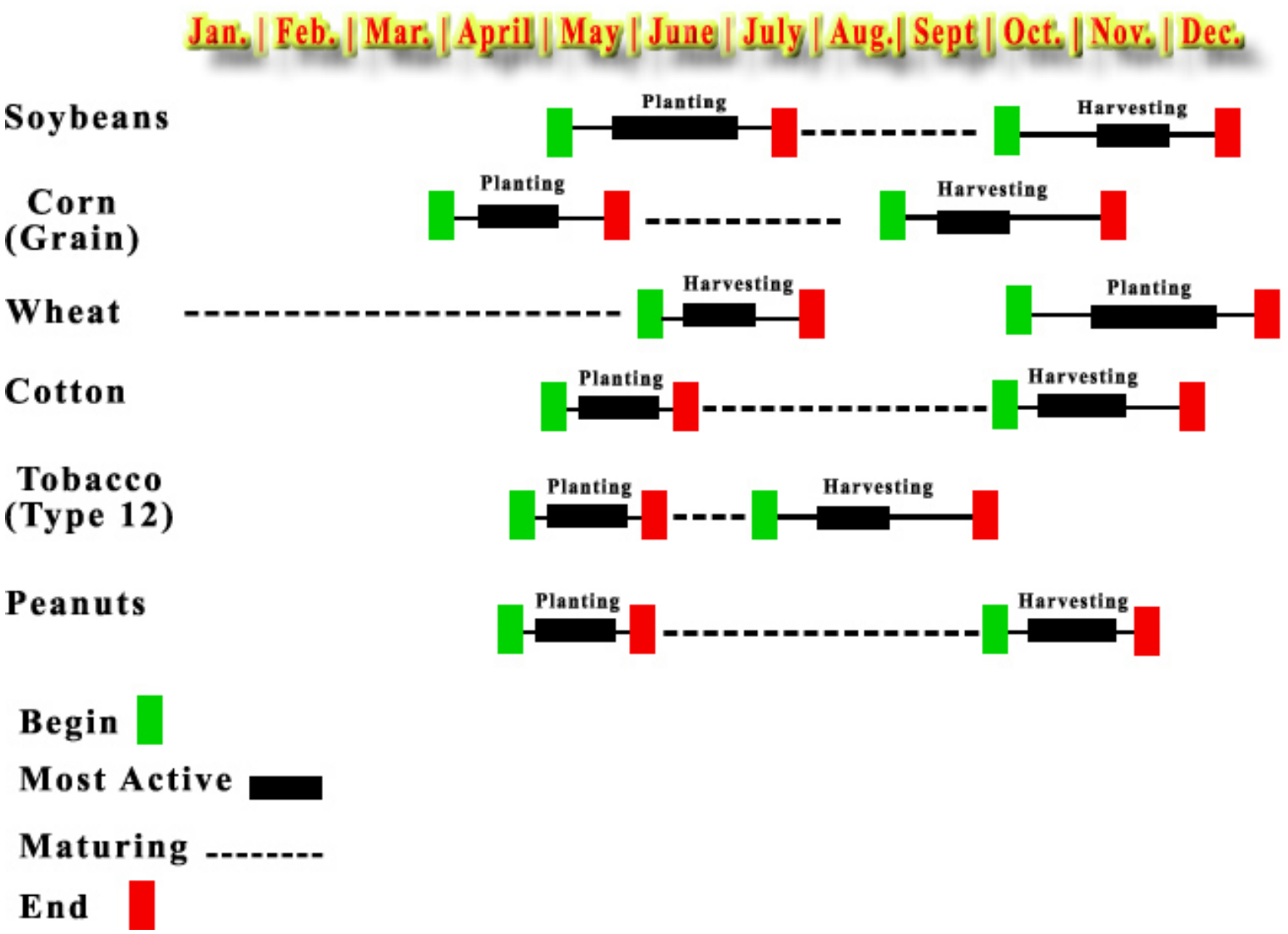
FARMERS & COMMODITY PRODUCERS & BUYERS FACE PRICE RISK

- No risk management and simplest strategy
  - Cash sale at harvest
- Hedging as risk management
  - Futures market contracts
  - Option market contracts – puts & calls
- Government Assistance
  - Crop insurance (premium subsidized)
- Use contracts
  - Forward price contract
  - Basis contract
- Use a Combination of all of the above

What is “PRICE RISK”?

- Price risk is the possibility that the price of a physical commodity may decline (producer) or rise (user)
  - For example at planting the presumption is that a grower will be able to deliver the commodity for sale at a price that is profitable
    - Between planting and harvest, price can increase or decrease
- The biggest driver of price risk in agricultural products is the weather
- For other commodities natural disasters, elections, geopolitical, logistics, can be drivers of price volatility

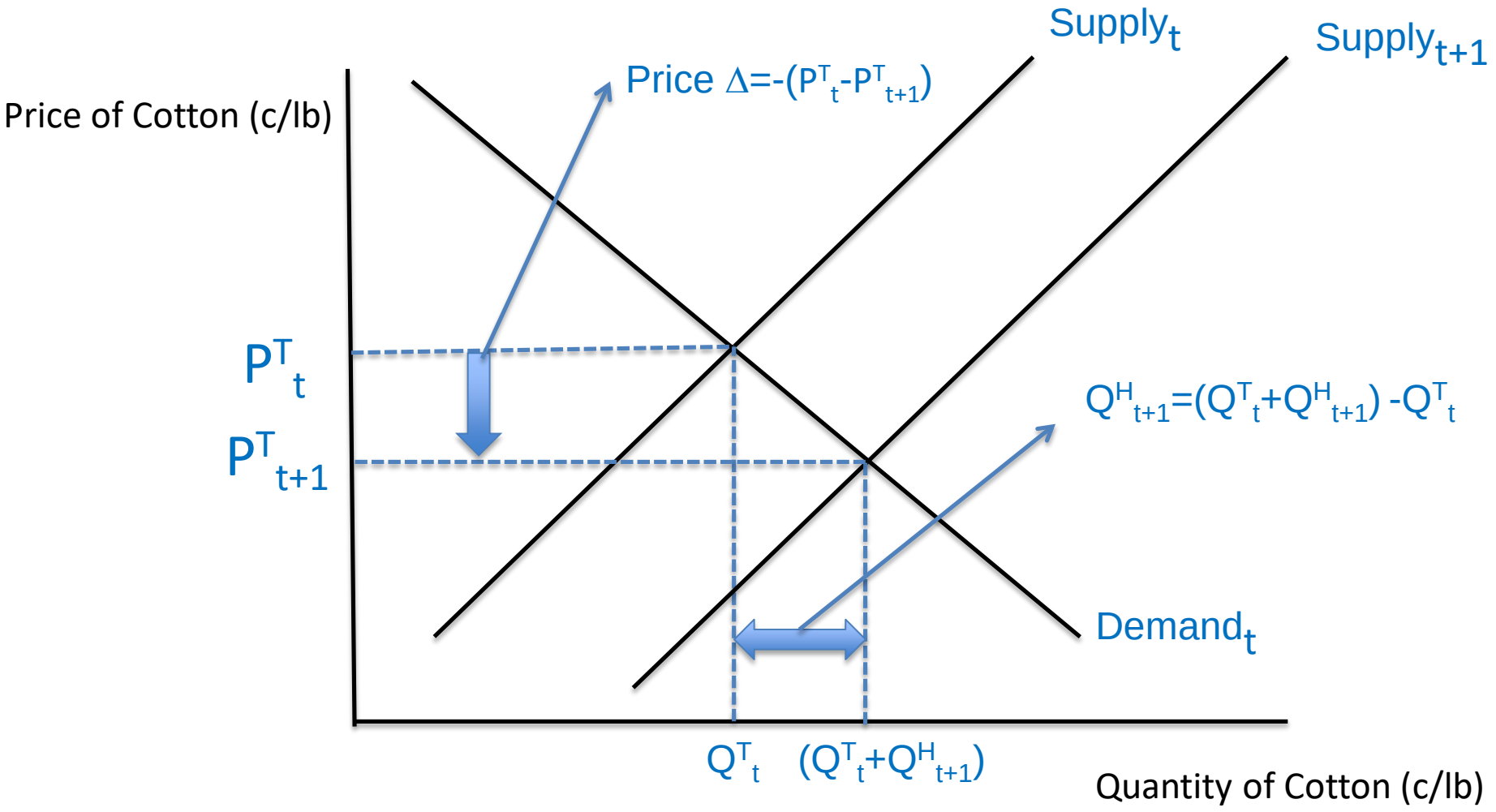
Usual Planting and Harvesting Dates Major Field Crops, North Carolina



PRICE RISK MANAGEMENT

- **If you are "LONG" cash price increases means opportunity. If price decreases this is a risk and you can lose money.**
  - **Taking actions to protect against the impact of price declines on the farm business in case they occur**
- **If you are "SHORT" cash price declines means opportunity. If price increases this is a risk and you can lose money.**
  - **Taking actions to protect against the impact of price declines on the farm business in case they occur**
- **What if you take no actions? Then, you have decided to accept whatever the going cash price at harvest when you deliver your crop or at procurement when you purchase (assuming no storage)**
  - **Often the strategy employed but mostly out of ignorance. There are tools and contracts as wells as markets to offset some of this price**
  - **We will spend significant time on learning what these alternatives are and how to implement. Basis will turn out to be a key driver in choosing alternatives.**

PRICE IN COTTONVILLE AT HARVEST (t+1) –IMPACTS OF GOOD CROP

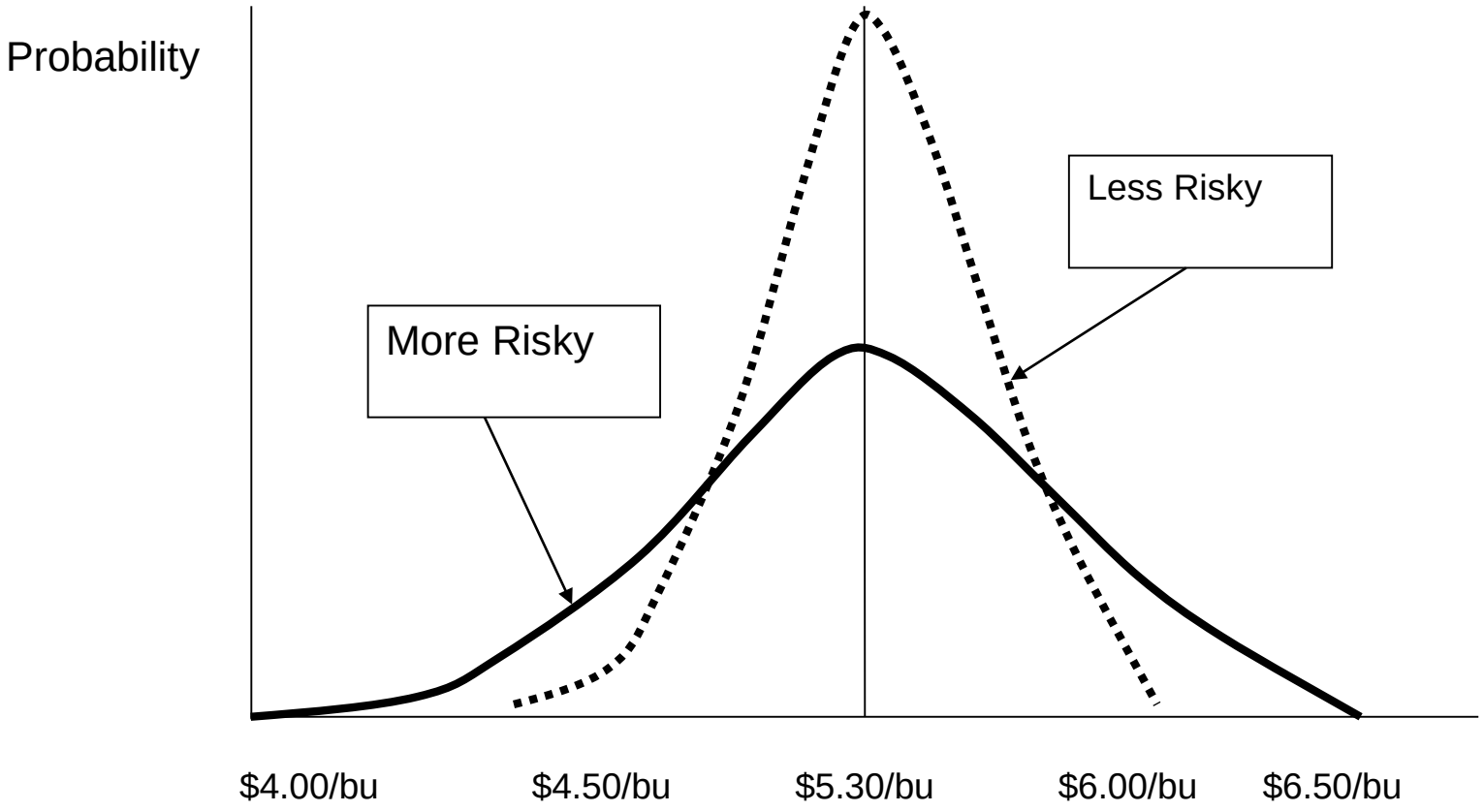


CONSIDERING YOUR MARKETING STRATEGIES

- **Do nothing strategy means you deliver your crop at harvest for the prevailing price**
  - **What is the local price likely to be at harvest compared to the other times of the year?**

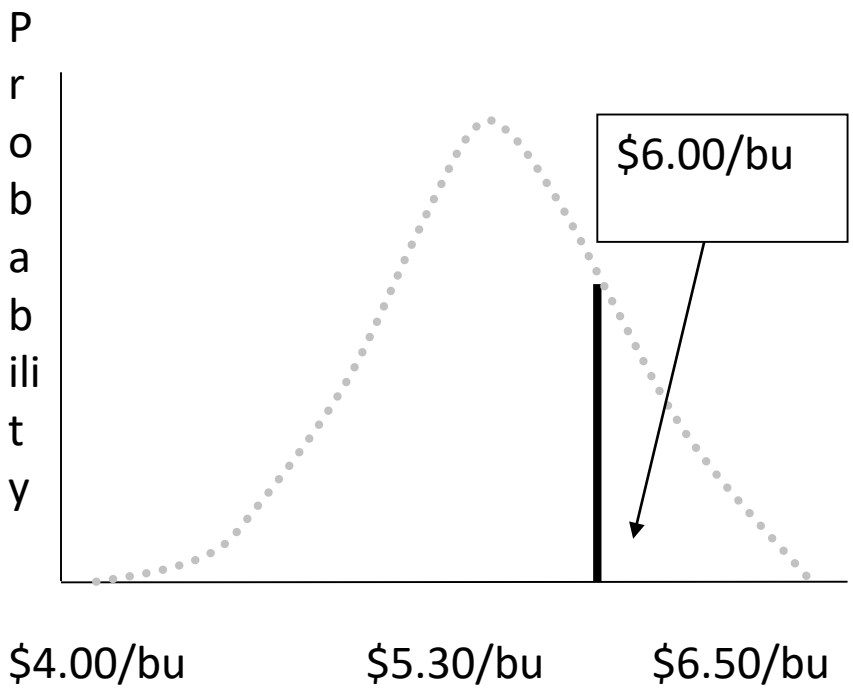
- **Can use the futures and options market to earn higher prices and still deliver at harvest**
  - **Examples include hedge with futures, hedge with options, and other contracts we will learn about soon**
  - **"Basis" (which we will learn more about soon) is a critical concept that helps you decide what is the best strategy**

VISUALIZING PRICE RISK

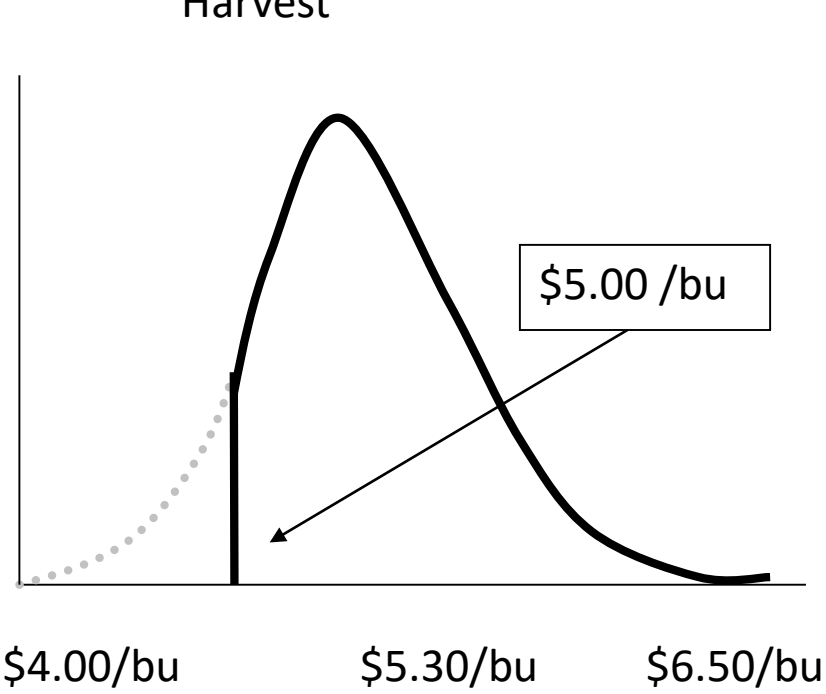


Transforming the PDF By Managing Price Risk

Locking in Cash Price



Setting a Cash Price Floor at Harvest



WHAT IS "BASIS"?

"Basis is the difference between local cash prices and futures market prices at any point in time."

$$BASIS_t = LOCAL\ CASH\ PRICE_t - FUTURES\ PRICE_t$$

AND, IT FOLLOWS THAT:

$$LOCAL\ CASH\ PRICE_t = FUTURES\ PRICE_t + BASIS_t$$

WHAT IMPACTS BASIS?

- **Availability and cost of transportation**
- **Local supply and demand in the cash market relative to delivery point in the futures**
- **Available storage capacity locally**
- **Quality differences between cash commodity and futures specifications**
- **Volume of imports & exports into the local area**
- **Price and availability of substitute commodities**

Why Are Corn Prices in NC Different than Chicago?

- BASIS
- What is the average corn basis in NC?
  - What is your best guestimate?
- How can we precisely calculate:

$$BASIS_t = LOCAL\ CASH\ PRICE_t - FUTURES\ PRICE_t$$

- Some important points
  - Basis is location specific & *every* market has its own basis
  - Basis is time specific must compare local cash price and futures prices on same day
  - Market is usually interested in two specific basis “the cash” (compare current local cash price with nearby futures) and the “new” compare local new crop forward price with new crop futures contract)

Current NC Cash and New Bids vs CME Corn Futures Nearby and New Crop (Snap Shot 2/2/2016)

US #2 Yellow Corn				
	Cash	New		
Bladenboro	4.46	4.42		
Candor	4.66	4.52		
Cofield	4.26	4.07		
Laurinburg	4.46	4.42		
Monroe	4.66			
Nashville	4.36			
Roaring River	4.66			
RoseHill	4.46	4.42		
Statesville	4.21			
Warsaw	4.46	4.42		
Pantego #2	4.41			
Elevators				
Bladenboro	4.01	4.27		
Clarkton	4.01	4.27		
Clement		4.21		
Clinton	4.21	4.32		
Creswell	4.01			
Elizabeth City	3.96	3.92		
Lagrange	4.06	4.22		
Mount Olive	4.21	4.27		
Norwood	4.46	4.32		
Warsaw #2	4.56	4.47		
Wilson	4.01	4.22		
Source: 2/2/2016				
Accessed: http://www.ams.usda.gov/mnreports/ra_gr110.txt				
Original Source:				
Source: North Carolina of Ag-USDA Market News, Raleigh, NC				
Stephen Beasley Market Reporter 919-707-3107				
http://www.ncagr.com/market/mktnews/RA_GR110.TXT				

Month	Options	Charts	Last	Change	Prior Settle
MAR 2016	OPT		372'6	+1'4	371'2
MAY 2016	OPT		377'4	+1'6	375'6
JUL 2016	OPT		382'2	+1'6	380'4
SEP 2016	OPT		386'4	+1'6	384'6
DEC 2016	OPT		393'6	+1'6	392'0

Nearby Mar2016=371'2=$3.7125

"New Crop" Dec2016=392'0=$3.920

Nearby Basis (2/2/2016)

	Cash	C-Mar2016	Nearby Basis
Bladenboro	$4.46	$3.7125	$0.75
Candor	$4.66	$3.7125	$0.95
Cofield	$4.26	$3.7125	$0.55
Laurinburg	$4.46	$3.7125	$0.75
Monroe	$4.66	$3.7125	**$0.95**
Nashville	$4.36	$3.7125	$0.65
Roaring River	$4.66	$3.7125	$0.95
RoseHill	$4.46	$3.7125	$0.75
Statesville	$4.21	$3.7125	$0.50
Warsaw	$4.46	$3.7125	$0.75
Pantego #2	$4.41	$3.7125	$0.70
Elevators			
Bladenboro	$4.01	$3.7125	$0.30
Clarkton	$4.01	$3.7125	$0.30
Clement	--	$3.7125	--
Clinton	$4.21	$3.7125	$0.50
Creswell	$4.01	$3.7125	$0.30
Elizabeth City	$3.96	$3.7125	**$0.25**
Lagrange	$4.06	$3.7125	$0.35
Mount Olive	$4.21	$3.7125	$0.50
Norwood	$4.46	$3.7125	$0.75
Warsaw #2	$4.56	$3.7125	$0.85
Wilson	$4.01	$3.7125	$0.30

Summary Statistics	
Average	$0.60
Minimum	$0.25
Maximum	$0.95

New Crop Basis (2/2/2016)

	New	C-Dec2016	New Crop Basis		Summary Statistics	
Bladenboro	$4.42	$3.9200	$0.50		Average	$0.38
Candor	$4.52	$3.9200	**$0.60**		Min	$0.00
Cofield	$4.07	$3.9200	$0.15		Max	$0.60
Laurinburg	$4.42	$3.9200	$0.50			
RoseHill	$4.42	$3.9200	$0.50			
Warsaw	$4.42	$3.9200	$0.50			
Elevators						
Bladenboro	$4.27	$3.9200	$0.35			
Clarkton	$4.27	$3.9200	$0.35			
Clement	$4.21	$3.9200	$0.29			
Clinton	$4.32	$3.9200	$0.40			
Elizabeth City	$3.92	$3.9200	**$0.00**			
Lagrange	$4.22	$3.9200	$0.30			
Mount Olive	$4.27	$3.9200	$0.35			
Norwood	$4.32	$3.9200	$0.40			
Warsaw #2	$4.47	$3.9200	$0.55			
Wilson	$4.22	$3.9200	$0.30			

Figure 2.5: Corn Elevators and Feedmills in North Carolina

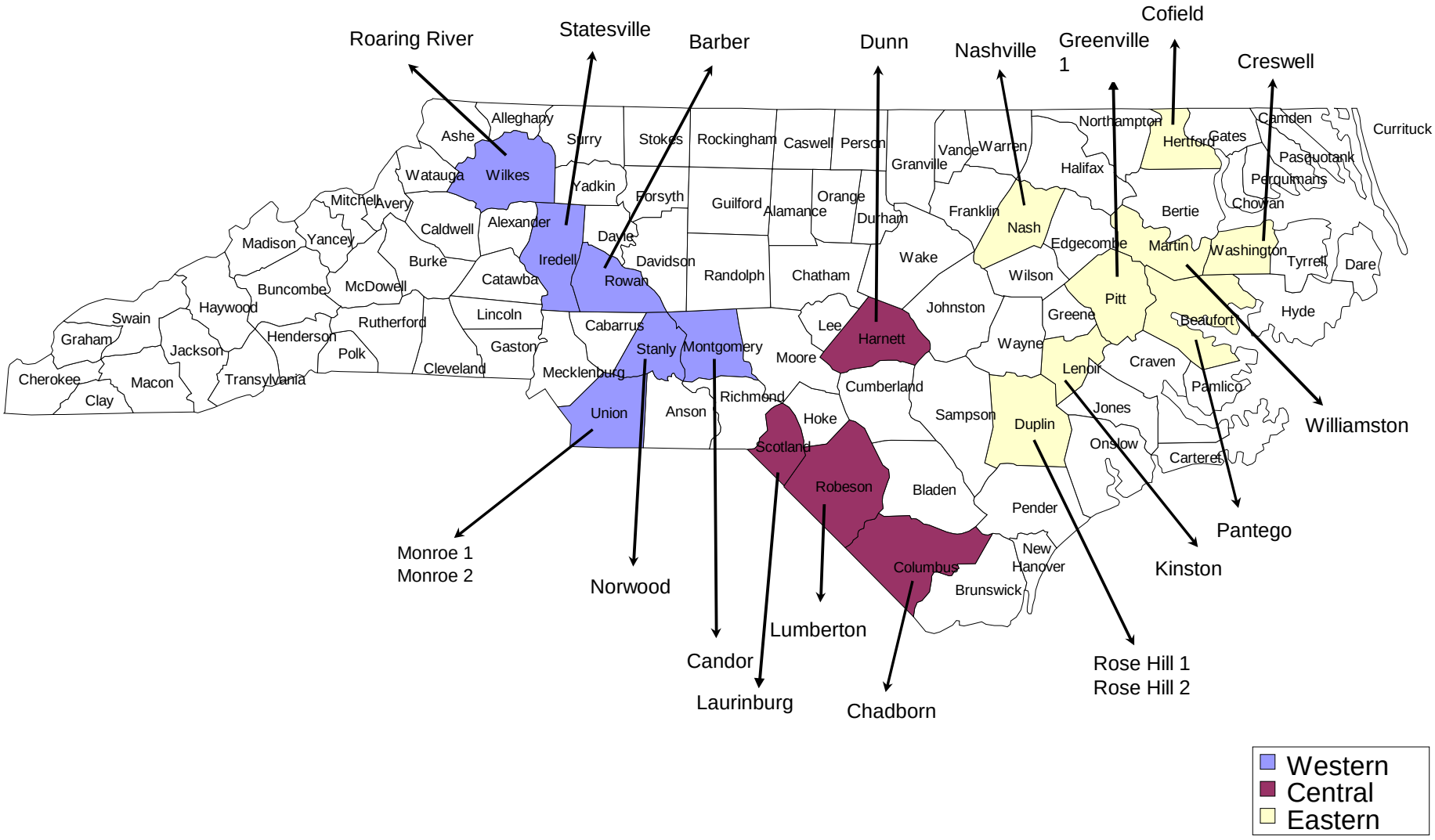


Figure 2.7: Seasonal Trends in North Carolina Corn Basis 1997-2002

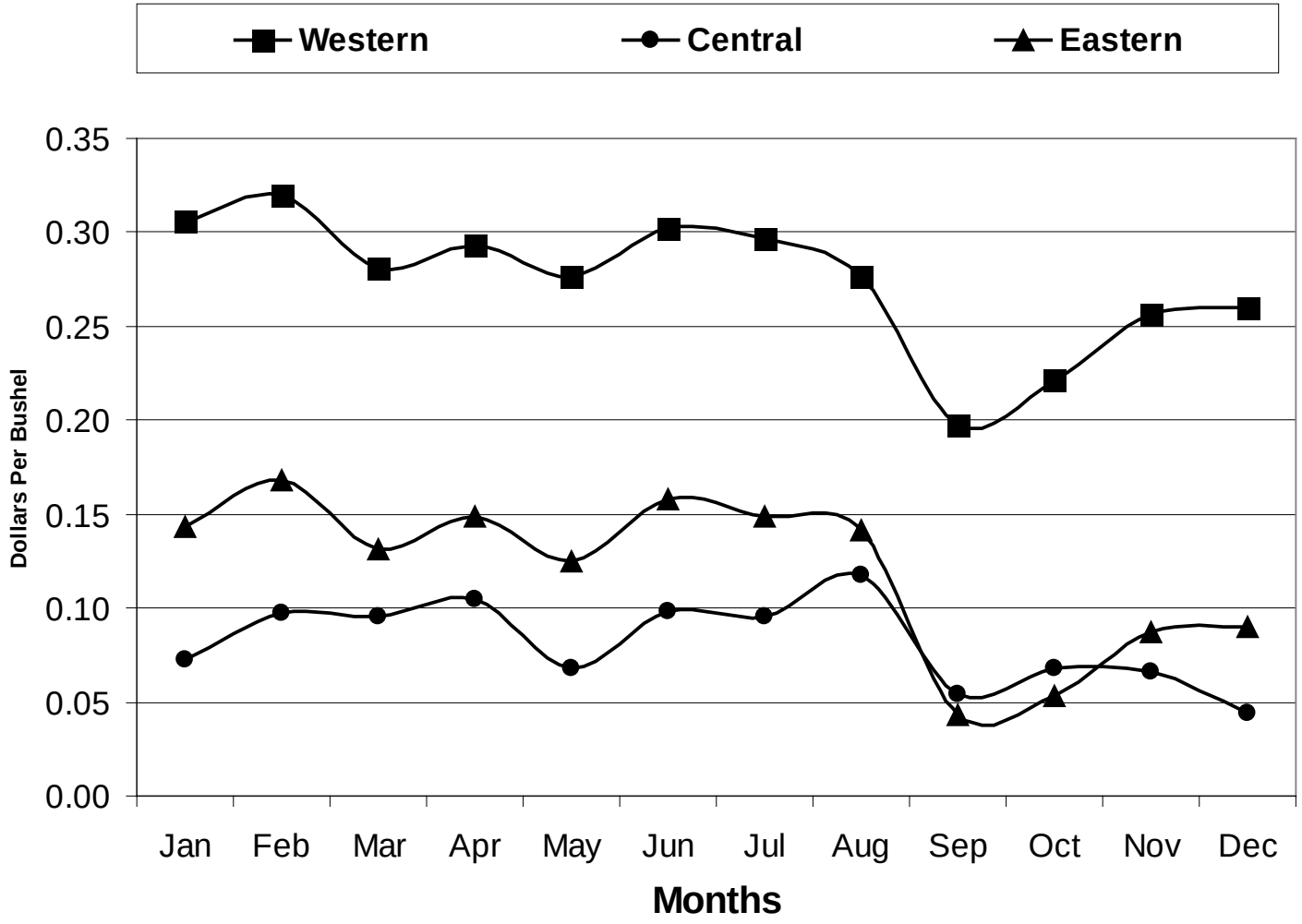


Figure 2.6: Elevators and Crushers in North Carolina

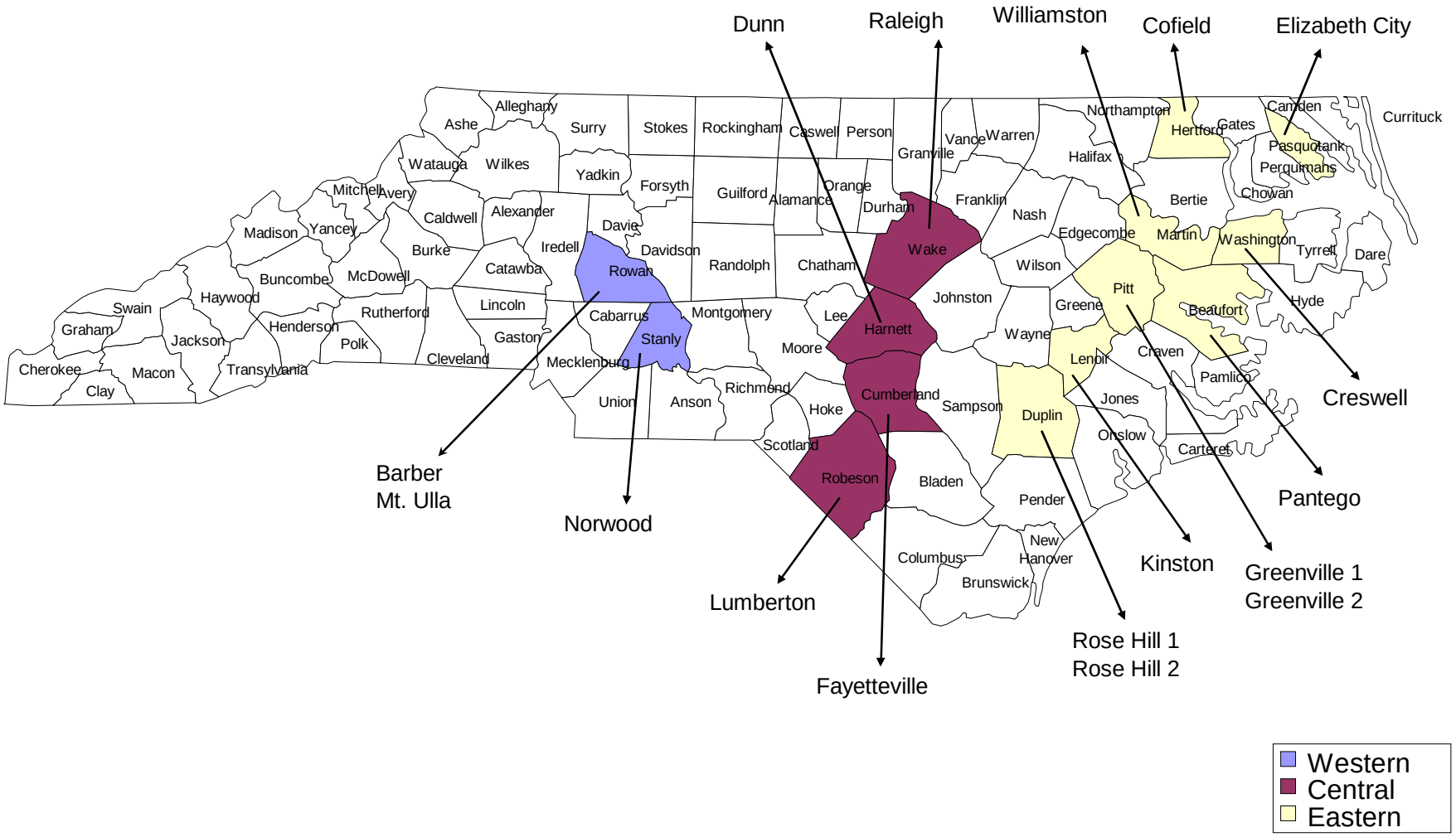
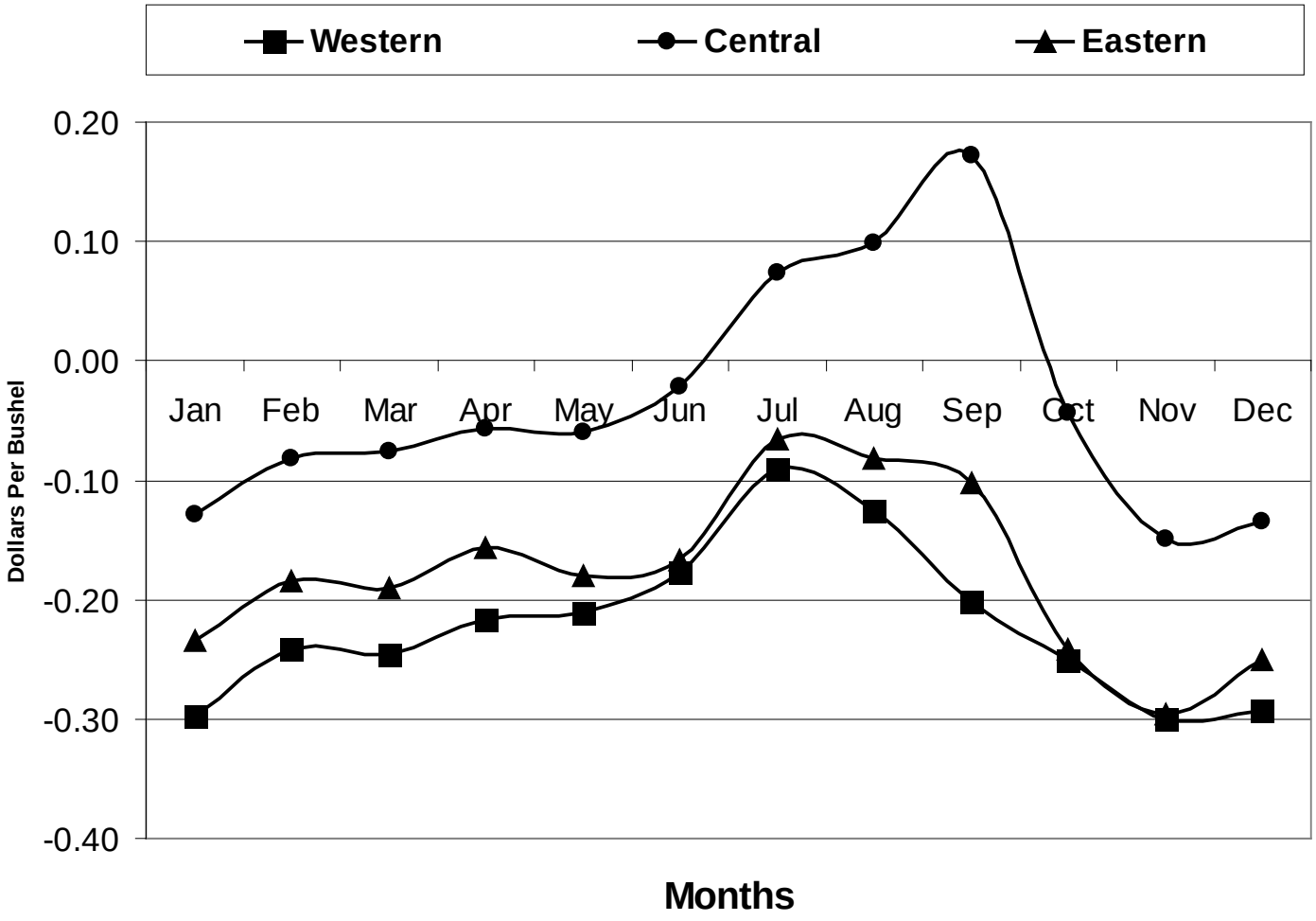
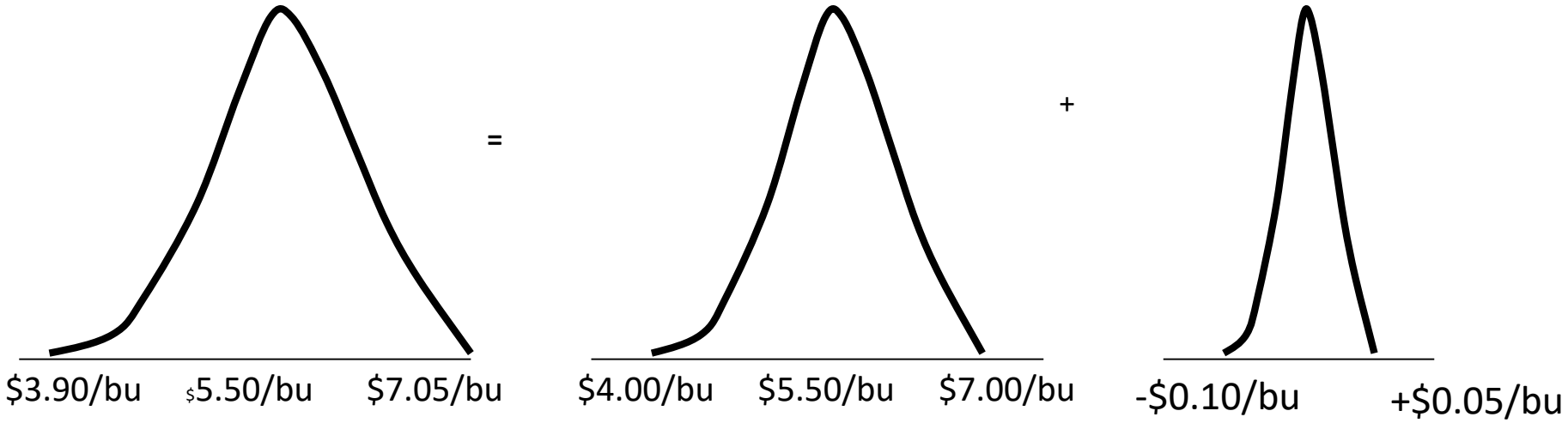


Figure 2.8: Seasonal Trends in North Carolina Soybean Basis 1997-2002



VISUALIZING CASH PRICES, FUTURES PRICE AND BASIS

Corn Cash Price PDF = *Corn Futures Price PDF* + *Corn Basis PDF*



KEY POINTS

- Local cash price can be thought of *conceptually* as the sum of two random variables, futures price and basis
- Futures price are more risky than basis and it is this relationship that is *fundamental to managing price risk*
  - Futures markets provide information about riskiness and opportunities and to hedge or offset this risk
  - Basis information is less readily available and historical estimates are used as a guide to future
- Understanding basis and particularly how it has moved historically through the calendar enhances a producers ability to make effective risk management decisions and to appropriately evaluate current bids and offers.

Homework #4: Reading and Calculating Nearby Basis

- Read “A Guide to Price-Risk Management in Grain Marketing for NC, SC, & GA” by Piggott, Shumaker, and Curtis pg. 25-53.

  https://ag-econ.ncsu.edu/wp-content/uploads/2017/09/basis_piggott_shumaker_curtis.pdf

  OR

  https://are415.wordpress.ncsu.edu/assignments/

- Based on your assigned **correspondent commodity** identify the “nearby contract” settlement for one-day this week (1/29,1/30 or 1/31). Also identify three locations with current cash bids for the same day at any location you chose. Calculate the basis for each offer. If you cannot find three locations with cash bids please explain why there are no cash bids. Due 1/1/2018 at beginning of class.