Agricultural Index Products: Strengths and Limitations

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Traditional Insurance

- Pays indemnities based on actual losses incurred by the policyholder.
  - Example: Actual Production History (APH) farm-level yield insurance sold through the Federal Crop Insurance Program.

APH Farm-Level Yield Insurance Example

APH Corn Yield	160 bushels per acre
Coverage	75%
Trigger Yield	120 bushels per acre
Price Election	$2.20 per bushel
Realized Yield	90 bushels per acre
Indemnity	$66 per acre

APH Farm Level Yield Insurance

- Limitations:
  - Potential for moral hazard.
  - Potential for misclassification (adverse selection).
  - Potential for sampling errors when calculating APH yields.
  - Potential for errors in loss adjustment.
  - High transactions costs.
  - Not always feasible to measure farm-level yield (e.g., hay, pasture, or rangeland).

Index Insurance

- Pays indemnities based not on actual losses incurred by the policyholder but rather on changes in the value of an index.
  - Example: Group Risk Plan (GRP) area-yield insurance product sold through the Federal Crop Insurance Program.

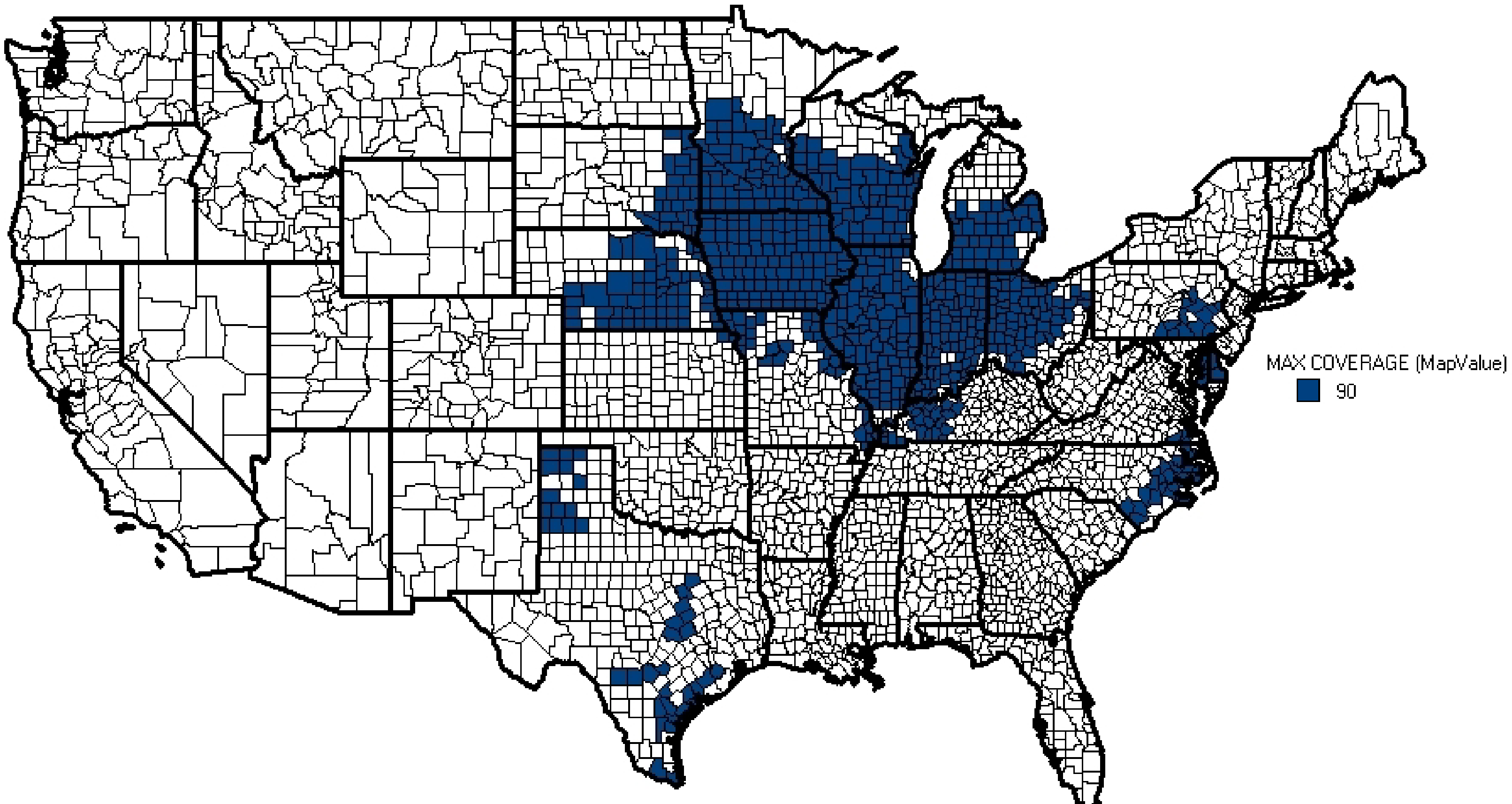
GRP Area-Level Yield Insurance Example

Expected County Corn Yld.	120 bushels per acre
Coverage	90%
Trigger Yield	108 bushels per acre
Price Election	\$2.20 per bushel
Scale	100%
Protection per Acre	\$264 (120 × \$2.20)
Realized County Yield	81 bushels per acre
County Yield Shortfall	25%
Indemnity per Acre	\$66 (\$264 × 25%)

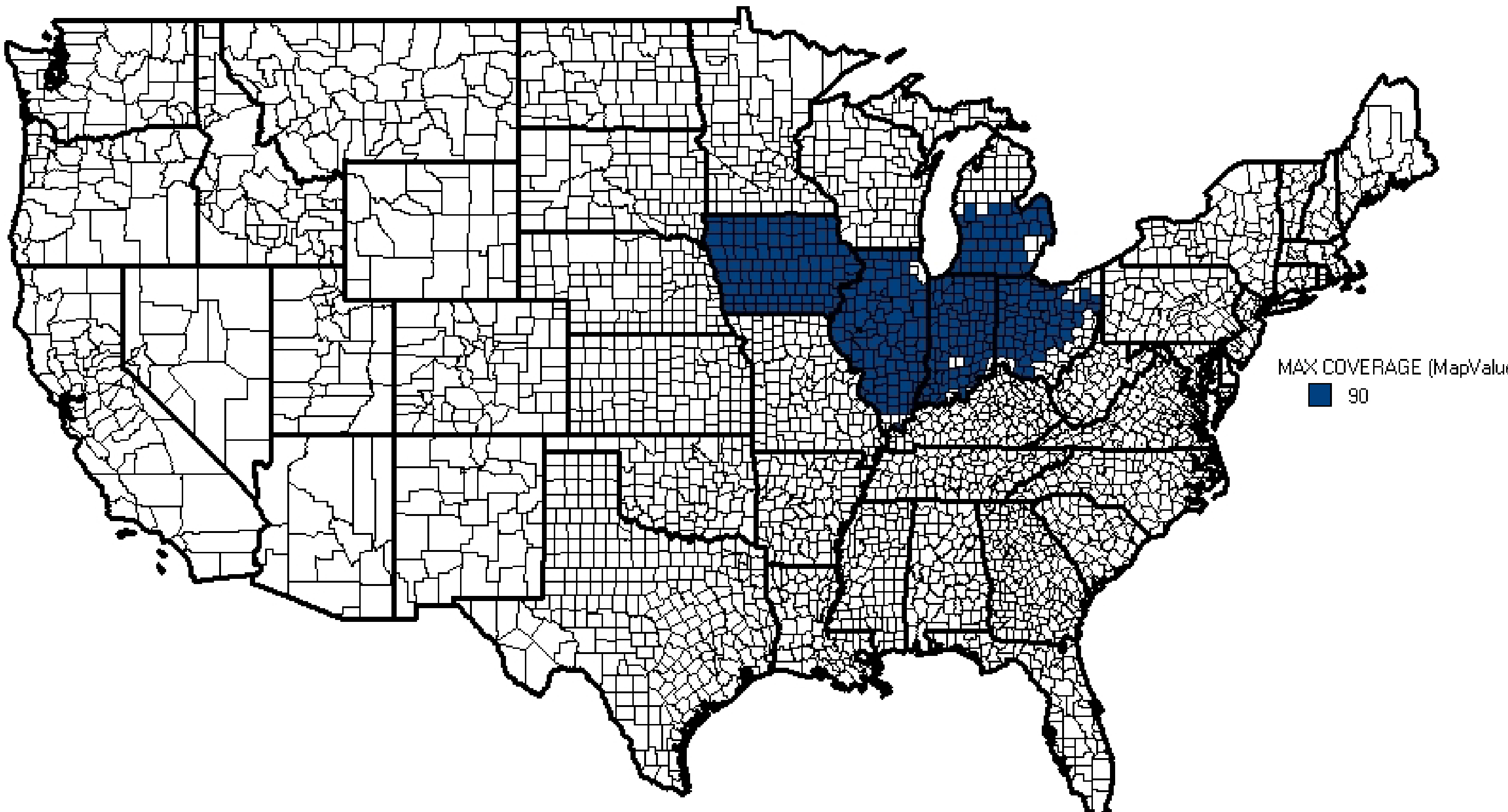
Area-Based Index Insurance

- Notice that the indemnity received by the policyholder is based not on the yield shortfall experienced on the policyholder's farm, but rather on the yield shortfall experienced in the county where the farm is located.
- The county average yield is the index.
- Group Risk Income Protection (GRIP) is an area-based revenue insurance product.

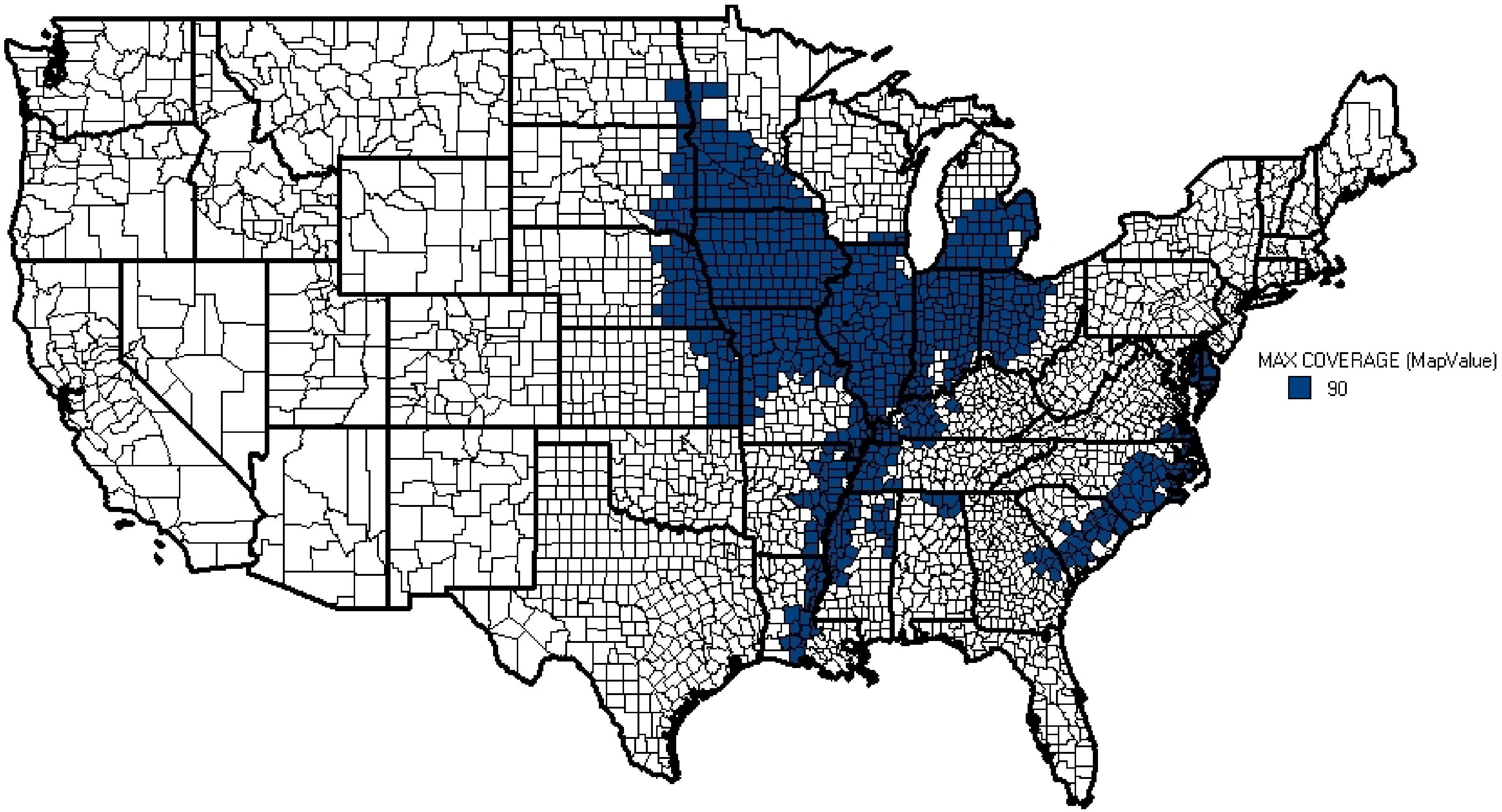
Corn GRP Availability



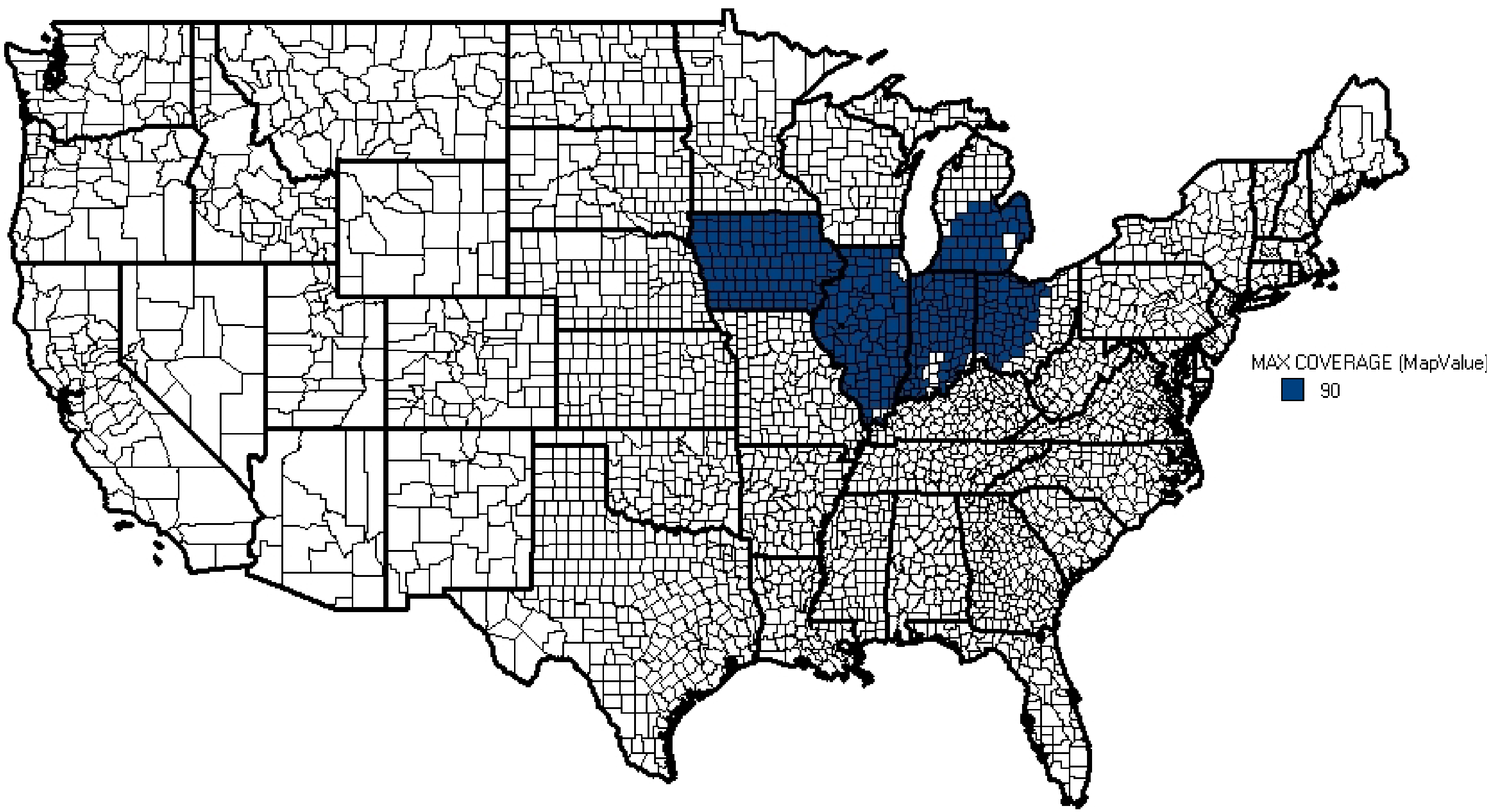
Corn GRIP Availability



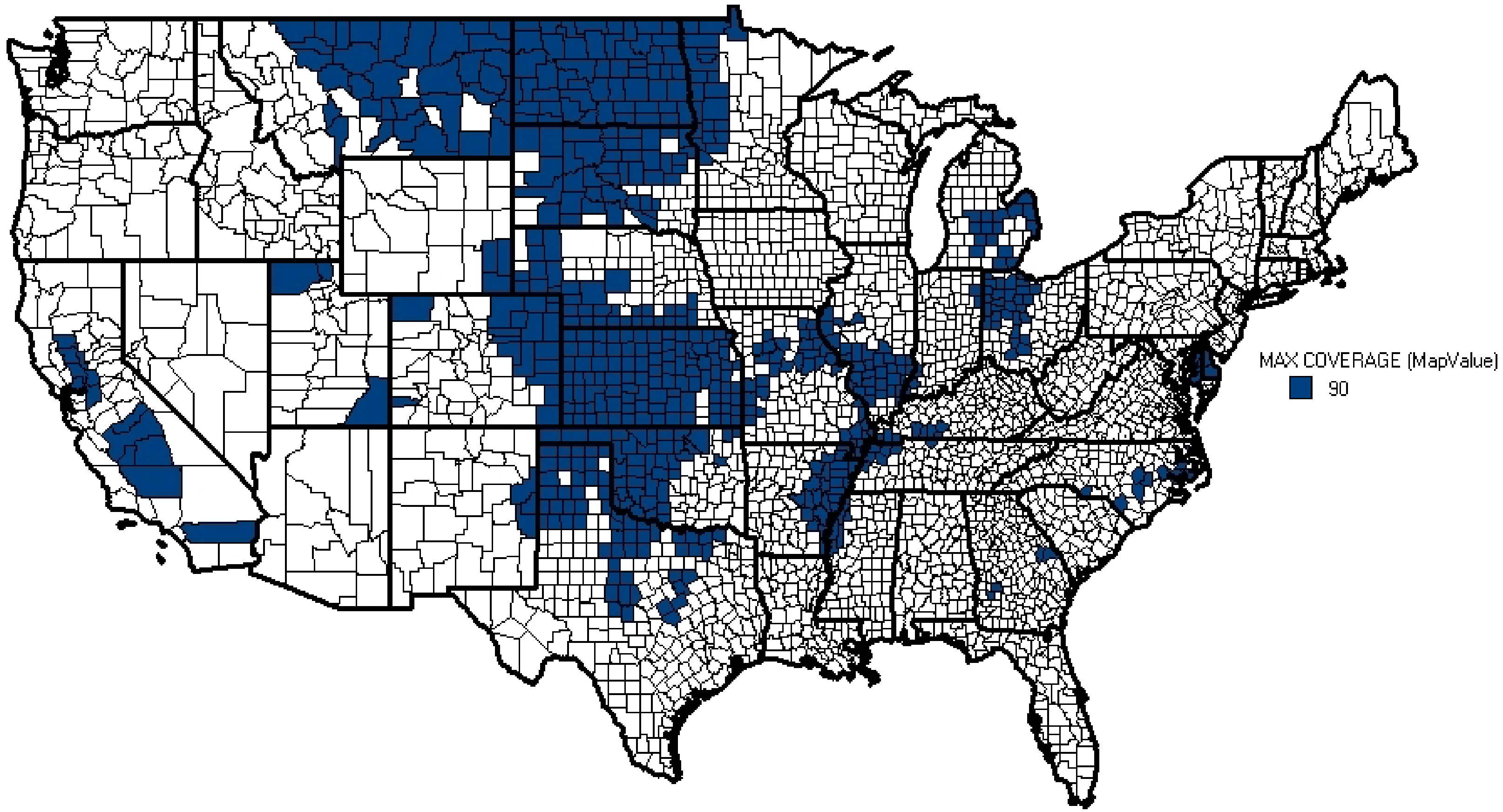
Soybean GRP Availability



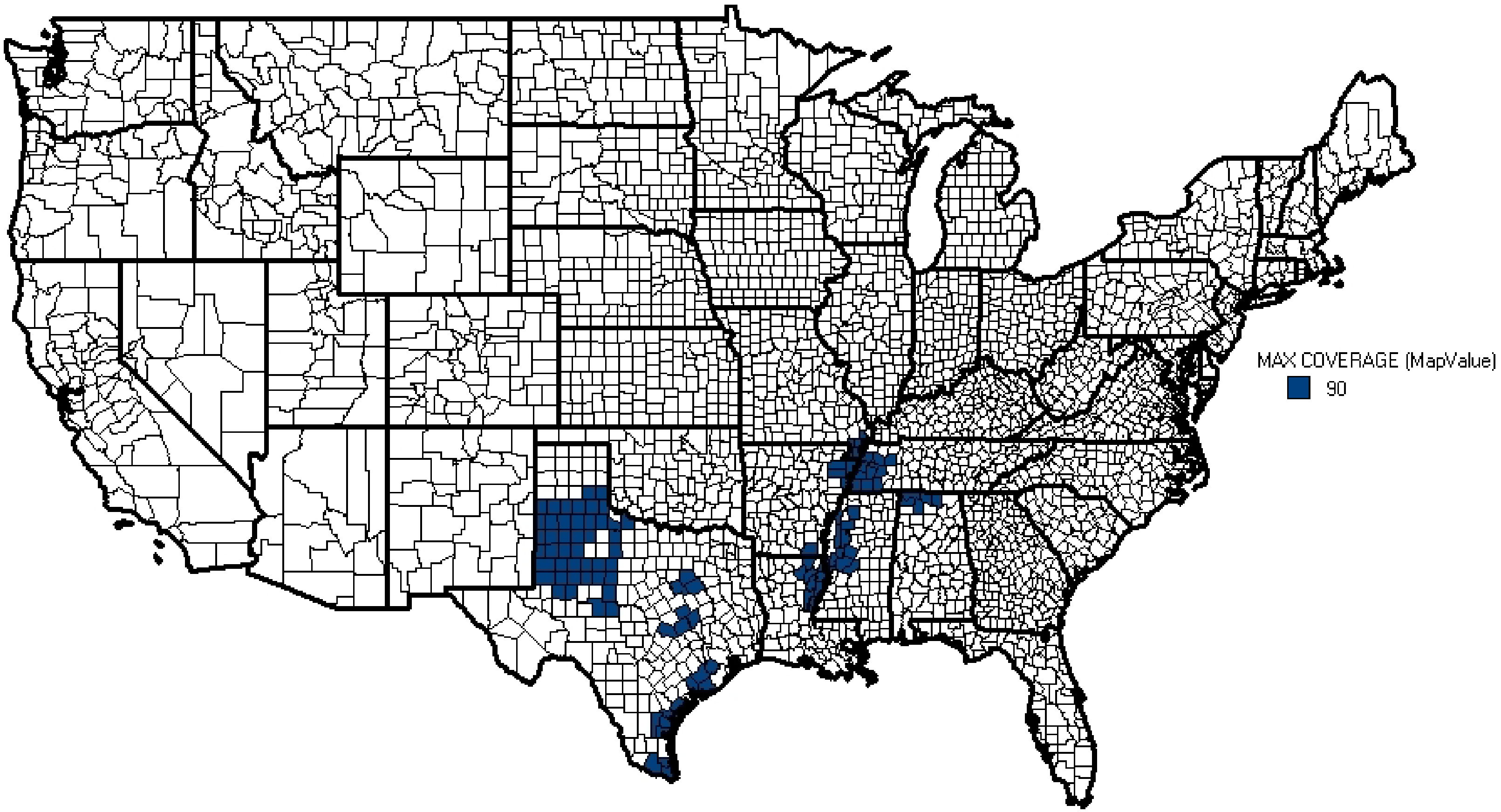
Soybean GRIP Availability



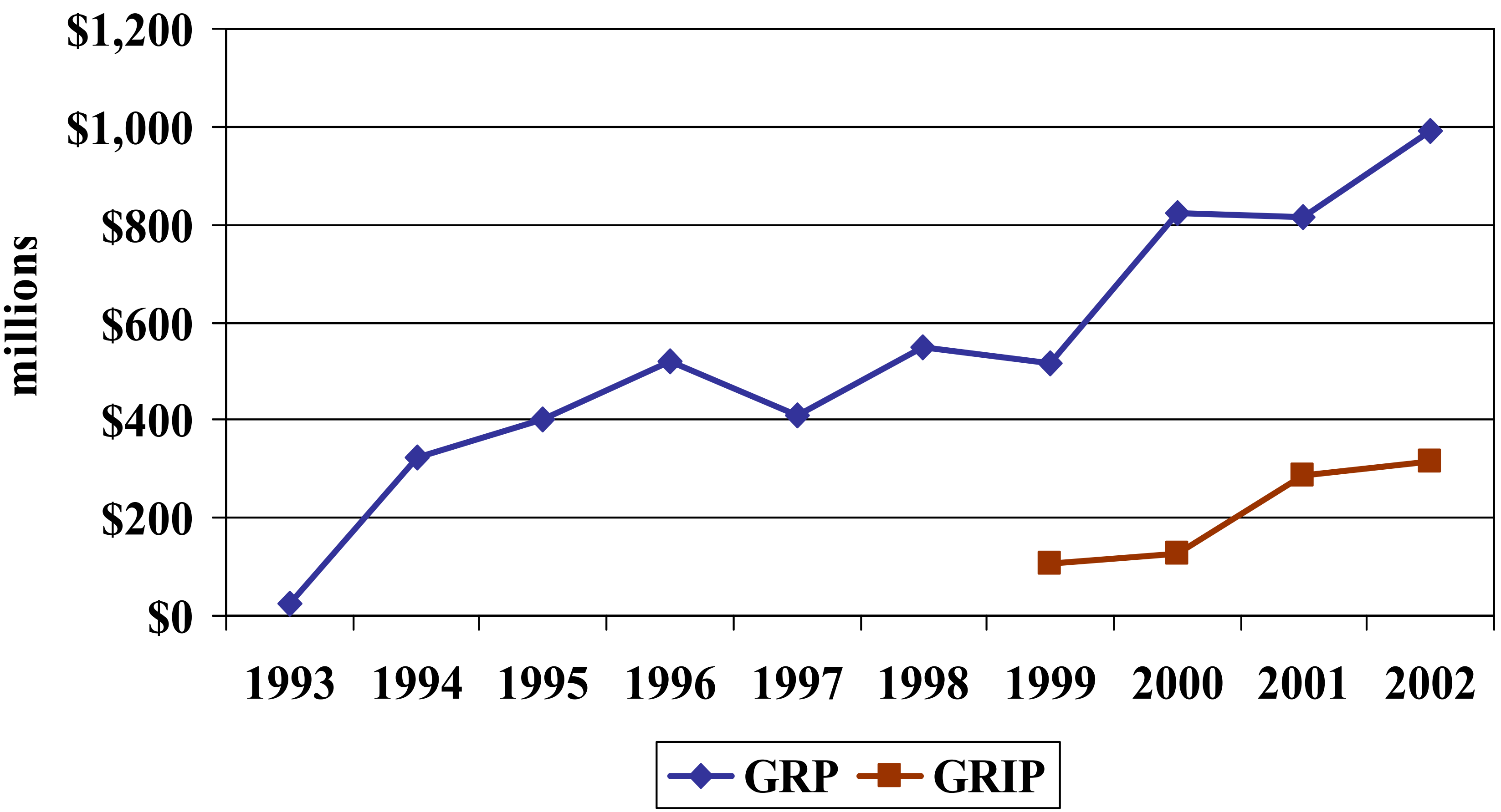
Wheat GRP Availability



Cotton GRP Availability



GRP and GRIP Liability



GRP and GRIP

- In 2003 GRP and GRIP accounted for only 6.3% of total acres insured, and only 4.0% of total liability, in the Federal Crop Insurance Program.

Why Index Insurance?

- Lower transactions costs.
  – No historic farm-level yield data are required.
  – No farm-level loss adjustment is required.
- No moral hazard (policyholder cannot affect the realized value of the index).
- No need for risk classification.
- Transparency (index is easily accessible).

Limitations of Index Insurance

- Basis Risk!
  - It is possible for a policyholder to experience a loss but not receive an indemnity.
  - It is also possible for a policyholder to not experience a loss but yet receive an indemnity.
  - Are farm-level losses highly correlated with the index?
  - Basis risk varies across commodities, regions, and farms.

Limitations of Index Insurance

- Not always easy for producers to determine whether farm-level losses are correlated with the index.
- Private-sector insurers must be able to offset their loss risk exposure through reinsurance or other financial markets.
- Under Federal Crop Insurance Program authority, the policyholder must be producing the crop that is insured. No speculating. No cross-hedging.

Livestock Price Insurance

- Livestock Risk Protection (LRP).
  - Protects against decreases in the market value of insured cattle or swine.
- Livestock Gross Margin (LGM).
  - Protects against decreases in the margin between the market value of swine and the cost of feed inputs.
- Both are index insurance products because indemnities are based not on prices received (and paid) by the producer but rather on changes in futures market prices (the index).
- Since they cover price rather than yield, basis risk is much lower than for GRP or GRIP.

Weather-Based Index Insurance Products

- Not currently available in the federal crop insurance program. Research is underway.
- Pays indemnities based on the extent to which various weather phenomena (precipitation, temperature, etc.) differ from expected levels.
- Is the weather phenomenon highly correlated with farm yields?
- Is the weather phenomenon measured at an official government weather station highly correlated with realized weather on the farm?

Weather-Based Index Insurance Products

- Likely would be a niche market.
- May hold potential for commodities where it is difficult to measure yield (hay, pasture, rangeland, etc.)

Conclusions

- Index insurance products are not a "silver bullet." They are an alternative product that may be useful for:
  - Producers who do not have farm-level yield data;
  - Areas where problems have caused premium rates on farm-level products to be prohibitively high;
  - Commodities for which it is difficult to measure yield;
  - Commodities that are highly susceptible to specific weather events (e.g., early freeze).