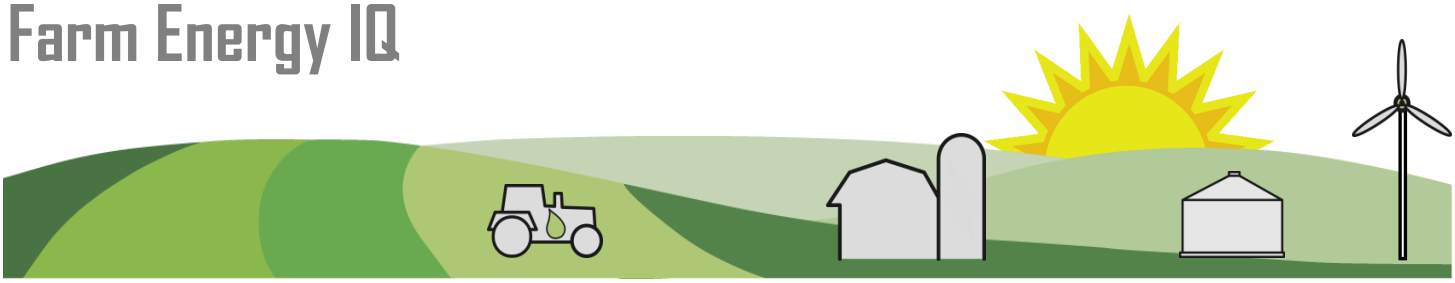
Farm Energy IQ



Bioenergy Feedstock Production—ASP Presentation Outline

Slide 1. Title Slide

Slide 2. Title Slide

Slide 3. The four objectives of this presentation are listed on the slide.

Slide 4. Corn is the most widely used feedstock for bioenergy and the experience to date offers useful lessons for other potential bioenergy commodities.

Slide 5. Corn is widely adapted across the U.S. with the bulk of production in the Midwest (see map).

Slide 6. This slide describes some of the basic management steps involved in corn production.

Slide 7. The basic costs in corn production are listed on this slide. Returns for corn production are variable, so checking current information, like that which is found on the link provided, is a good idea.

Slide 8. This slide describes the value that can be derived from a bushel of corn at an ethanol plant and shows that, at current prices, there is a significant increase in crop value by processing corn into ethanol. These values can vary dramatically with input costs and prices.

Slide 9. Corn cobs are a byproduct of corn production that also can be used for energy production.

Slide 10. This slide describes some of the ways that corn cobs can be collected.

Slide 11. Various systems exist to collect corn cobs. Here is one marketed by Redekop, where cobs are collected from the material leaving the combine, cleaned, and stored in wagon towed behind the combine.

Slide 12. One way to increase the amount of bioenergy feedstock collected is to include materials other than the cobs (MOCs), which some operations are doing.

Slide 13. Another method for cob collection is to harvest the cob and other material from the windrow. This is a method developed by POET called EZ bale. Cobs and the tops of stalks and husks are deposited in the windrow and then baled behind the combine.

Slide 14. Even though corn cobs are byproducts, there is cost associated with their collection. In this example, they totaled $54/ton.

Slide 15. Increasing the amount of MOC can increase yields per acre from 20 to 30% and reduce cost per ton of material collected.

Slide 16. Alternative uses of cobs for mushroom compost, animal bedding or as a polishing compound can add value to the commodity when the market for cobs for energy is low.

Slide 17. Soybeans are often grown for protein meal, but the oil can also be extracted as a biodiesel feedstock. Note that the energy yield from biodiesel oil is lower than that for corn ethanol (31.5 million Btu), but soybeans have valuable rotation benefits in the cropping system.

Slide 18. Soybeans are widely grown through the Mid-Atlantic and Midwest.

Slide 19. This slide describes the basics of soybean production.

Slide 20. This shows some of the basics production costs for soybeans.

Slide 21. Canola, or rapeseed as it is called in many areas (including Europe), is another oilseed crop that is in the mustard family. It has higher oil content (38-40%) than soybeans (19-20%), and thus a higher oil yield/acre.

Slide 21. Canola is widely adapted but can have difficulty competing with other crops such as wheat or soybeans. Most production is in North Dakota in the U.S.

Slide 23. This is an example of management involved in growing spring canola.

Slide 24. This is an example of the production cost of canola. It is very similar to a small grain crop like wheat.

Slide 25. This shows a canola field being combined. Unlike wheat, however, the straw has little value. It is not very absorbent and has many seeds.

Slide 26. Canola can be pressed into a high protein meal and canola oil using an on-farm press like this one.

Slide 27. Canola meal can be marketed as a quality protein supplement for many types of livestock. Finding small retail markets for canola meal can add to profitability.

Slide 28. This spreadsheet, developed by the University of Vermont, helps producers estimate the potential profit associated with oilseed production and processing.

Slide 29. This slide provides more detail on oilseed economics.

Slide 30. Switchgrass is a widely adapted perennial grass that can be grown on marginal lands. This slide describes some of the energy potential, yield, and other attributes of switchgrass.

Slide 31. Once established, switchgrass management is fairly simple, as described on this graph, with a single harvest in late winter or early spring.

Slide 32. Switchgrass can be grown from Florida to the corn belt on both productive and droughty soils.

Slide 33. This slide describes the cost of the production in both the establishment year and after the crop has been established. This is from Kentucky.

Slide 34. This is another switchgrass budget, from Penn State.

Slide 35. Here is a picture of switchgrass grown on marginal land in Westmoreland County, Pennsylvania.

Slide 36. Here is a summary of some of the key issues facing switchgrass development as a bioenergy feedstock.

Slide 37. Miscanthus is another potential bioenergy crop. This slide lists some bioenergy production details.

Slide 38. This shows a comparison of Miscanthus and switchgrass growing in Lancaster County, Pennsylvania.

Slide 39. Miscanthus is a widely adapted warm season perennial grass, native to Eastern Asia, and now grown in Europe, and Southern, Eastern and Midwestern U.S.

Slide 40. This is an example of management in the establishment year for Miscanthus.

Slide 41. This is an example of management in the post establishment years for Miscanthus.

Slide 42. This provides a summary of costs in the initial year and years 4 through 15.

Slide 43. This slide describes some issues of Miscanthus biomass production, which includes the need for a buffer around the field to prevent spreading.

Slide 44. Shrub willow is another biomass energy feedstock. This slide shows some production characteristics associated with shrub willow.

Slide 45. Willows grow on good soils as well as on marginal soils, not droughty or excessively wet, and sloped less than 8% for harvesting.

Slide 46. This describes the management over a 21-year span, with harvests occurring in years 5, 9, 13, 17, and 21.

Slide 47. In this example, the annual income over 21 years was $36/acre.

Slide 48. This slide describes some of the issues associated with shrub willow.

Slide 49. This slide summarizes the concepts discussed in this presentation.

Slide 50. This slide continues with more concepts discussed in the presentation.

Slide 51. This slide is a summary of the presentation, listing three major points.

Slide 52: Questions.

This project supported by the Northeast Sustainable Agriculture Research and Education (SARE) program. SARE is a program of the National Institute of Food and Agriculture, U.S. Department of Agriculture. Significant efforts have been made to ensure the accuracy of the material in this report, but errors do occasionally occur, and variations in system performance are to be expected from location to location and from year to year.

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