ENVIRONMENTAL EFFECTS OF BIOENERGY FEEDSTOCKS

(find full Module at http://articles.extension.org/pages/73973 )

ACTIVITY: Tracking carbon throughout the lifecycle of cellulosic ethanol; from growing switchgrass to conversion to use of the fuel.

1. Cut out each equation on the dotted line below.

2. Provide participants images of process and chemical equations so that they can match each equation with its process from start to finish. The correct sequence is:

   (I) with (A), (C), (E), or (F)
   (K) with (B)
   (L) with (D)
   (J) with (A), (C), (E), or (F)
   (N) with (A), (C), (E), or (F)
   (M) with (G)
   (O) with (A), (C), (E), or (F)
   (P) with (H)
(A) Octane → Carbon dioxide

(B) Carbon dioxide

(C) Octane → Carbon dioxide

(D) Nitrogen gas → Ammonia → Carbon dioxide
(E) Octane \[\rightarrow\] Carbon dioxide

(F) Octane \[\rightarrow\] Carbon dioxide

(G) Glucose, cellulose and other carbohydrates \[\rightarrow\] Ethanol, Carbon dioxide

(H) Ethanol \[\rightarrow\] Carbon dioxide
Planting
Harvesting
Plant production (after first season of growth)
Fertilizer application
Cellulosic ethanol production
Baling and transportation to biorefinery
Transportation of ethanol to gas station
Driving with ethanol