EXPANSION OF CANOLA PRODUCTION IN SOUTHEASTERN U.S.

R. Ward, E. Cebert and K. Ward

Department of Biological and Environmental Sciences, Alabama A&M University

P.O. Box 1208, Normal, AL 35762

ABSTRACT

Canola production in the U.S. has not kept pace with the domestic demand for canola as food oil and biodiesel feedstock. Eighty three percent of the three billion pounds of canola the U.S. consumes annually is imported from Canada. The development of winter canola varieties has spurred production in the Mid-south and has great potential to expand in acreage in the southeastern region particularly with the growing interest in canola farming among commercial growers in north Alabama and neighboring areas in Tennessee and Georgia. Mild winters, adequate winter rainfall, the potential to double-crop and the availability of local soybean oil processing facilities make the southeastern United States a promising site for canola production. This paper provides an account of farmer adoption of canola as an alternative crop to winter wheat in the region.

INTRODUCTION

HISTORY OF PRODUCTION

➢ **In 2010, U.S. canola consumption reached 3 billion pounds, 83% of which was imported from Canada. Currently, U.S. canola acreage is approximately 1.5 million acres compared to Canada's 16 million. Ninety percent of U.S. canola is produced in North Dakota and Minnesota.**

➢**The development of winter canola cultivars spurred the production in the southern Great Plains, Pacific Northwest, Midwest and southeast. Oklahoma and Kansas increased canola acreage by > 156,000 acres in 2011. In the wake of energy crisis and political instability in the Middle East, the potential use of canola as feedstock for biodiesel further fueled interest in canola farming nationwide.**

➢**Variety trials and research studies conducted in Georgia, Kentucky, Arkansas, Mississippi and Alabama showed that winter canola has great economic potential as an alternative to wheat in a double cropping system in the southeastern region.**

➢**In mid-1990's, canola was grown commercially in Georgia, Alabama, South Carolina and northern Florida, peaking at 25,000 acres (Buntin et al., 2010).**

➢**A few farmers in North Alabama ventured into canola production in early 80's when the crushing plant in Chatanooga, TN was in operation. With the closing of the mill, commercial canola farming was completely abandoned in the area. However, increasing concern for energy security piqued the nation's interest in canola as feedstock for biofuel.**

➢**Exhaustive scientific experiments were conducted in Georgia and Alabama early on. These studies were focused on the genetic and agronomic improvement necessary for the eventual adoption of canola by farmers in the southeast.**

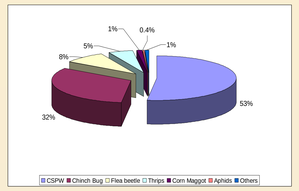
➢**The apparent lack of market potential at the time diminished interest in developing canola as an alternative winter crop in the region.**

FACTOIDS

➢**The United States imports about 60% of its oil consumption; this dependence on foreign oil undercuts national security particularly when oil supply was predicted to be extremely limited in the next 40-50 years (Youngquist & Duncan, 2003).**

Adult cabbage seedpod weevil (CSPW)

Canola pods showing CSPW exit holes



Insect infestations (2002)

Seed yield:	67 bu/a
Market price:	$12.40/bu
Oil :	~40%
Meal protein:	38%
Biodiesel yield:	175 gal/a

Canola field day for Alabama farmers (Tanner, AL 2008)

Early maturing canola lines (yellow flowers vs. green pods)

FACTOIDS (Cont'd.)

➢**Hence, the U.S. is currently seeking renewable resources primarily from oilseed crops such as soybean, cotton, sunflower, peanuts and canola as alternative sources of bioenergy.**

➢**As feedstock for biodiesel production, canola is comparatively superior to soybean; canola seeds contain higher amount (40% vs. 20%) of oil and of better (superior) quality than soybean. It is also more profitable farm crop. At 29 bu/acre yield, soybean can generate only 43 gal oil/acre, much less than canola yield of 75 gal oil/acre.**

➢**As a replacement to winter wheat, canola fits well in soybean production systems. Early maturing canola can maximize oilseed production on given land area by double cropping it with soybean.**

➢**With the development of superior, high yielding winter canola varieties suitable for the region, canola has regained farmers' interest in the southeast.**

➢**Although limited commercial canola production exists in some states such as Georgia, Alabama and Tennessee, exploration of canola as a winter crop is also on-going in other states including Arkansas, South Carolina, North Carolina, Florida, Virginia, Mississippi, Louisiana and Kentucky.**

CURRENT STATUS AND CHALLENGES

➢**Corn has replaced cotton as the "King" in the south. However, drought and limited irrigation systems pose a constant threat to profitable corn production. This past spring, corn farmers suffered severe crop losses due to drought.**

➢**In the aftermath of agricultural disaster brought on by drought, local farmers who grew canola in the previous season were rest assured some profits have been already made reducing negative financial impact on the farm.**

CURRENT STATUS AND CHALLENGES (Cont'd.)

➢**Although several farmers have successfully adopted winter canola into their cropping system, initial challenges they had to overcome included:**

1. **Market – has remained the bottle neck to successful adoption of canola in the southeast**
2. **Attitude change – breaking the age-old farm routines farmers find difficult to make; however, they are willing to try new crop following successful farming by peers**
3. **Farm retooling from planting to harvest – adjustment of existing farm equipment and machineries to accommodate canola production, and potential additional capital investment deter farmers from adopting new crop**
4. **Effective agronomic practices for profitable canola farming (from development, screening/evaluation and use of superior cultivars, soil fertilization and crop rotation to post harvest treatments, handling and storage)**
5. **Pest management – Elimination or reduction of plant damage due to pest insects, diseases and weeds is imperative to ensure crop profit. Pest occurrence varies with location. In the southeast, cabbage-turnip- green peach aphid complex (*Brevicoryne brassicae*, *Lipaphis erysimi* and *Myzus persicae*) and cabbage seedpod weevil (*Ceutorhyncus obstrictus*) are most problematic insect species . Canola in the south are also severely affected by black leg (*Leptosphaeria maculans)* and white mold (*Sclerotinia sclerotiorum*). In Georgia, problem weeds are Italian rye grass (*Lolium multiflorum)*, wild radish (*Raphanus raphanistrum*), chickweed (*Cerastium vulgatum*), henbit (*Lamium amplexicaule*) , hairy vetch (*Vicia villosa*) and wild garlic (*Allium viniale*) whereas in north Alabama, American vetch (*Vicia americana*) , tumble weed (*Salsola tragus*), entireleaf morning glory (*Ipomoea hederacea* var. *integriuscula),* and pigweed (*Amaranthus spinosus*) could be a problem.**

REFERENCES

Buntin , D., T. Grey, G. Harris, Jr., D. Phillips, E. Prostko, p. Raymer, N. Smith, P. Sumner &.J. Woodruff. 2010. Canola production in Georgia. UGACAES Publications B 1331.

Youngquist, W., & Duncan, R. C. (2003). North American natural gas: data show supply problems. Natural Resources Research 12 (4): 229-240.

CURRENT STATUS AND CHALLENGES (Cont'd.)

6. **Crop rotation scheme in double cropping systems – double cropping with soybean and corn is compatible with canola production. However, canola is harvested past optimal planting date for cotton in the south.**
7. **Harvesting – indeterminate plant produce seeds with varying dates of maturity; use of harvest aids to synchronize seed maturation; pod shattering is also a problem**
8. **Storage – clean storage facility free of pests (insects and diseases) and heat stress**

MEETING the CHALLENGES

Certain measures have been placed to address various challenges previously enumerated.

***Market* – A few farmers in north Alabama, Southern Tennessee and Georgia have struck an agreement with either of two oilseed processing companies (Agstrong, LLC and Resaca Sun Products, LLC) to directly sell their canola harvest. For north Alabama farmers, a drop off site has been designated for farmers' convenience. This arrangement reduces farmers' transportation cost. Agstrong, LLC plromised to build a processing plant in Morgan County when canola acreage reached 15,000 in the area.**

***National variety trials* are being conducted across the southeast in order to identify high yielding cultivars that are best adapted to the growing conditions in the region. This also includes selection for other canola characteristics such as high quality seed oil and meal for human and animal consumption, and as promising renewable feedstock for biofuel production.**

***Breeding programs* have resulted in the development of germplasms resistant to blackleg disease (Flint) and early maturing lines (Oscar in Georgia; AAMU breeding lines in Alabama). In the last decade, atAAMU early maturing winter canola lines are more compatible with cotton production in a double cropping system in the south. Early harvest allows for a few more days for land preparation for cotton production. Soybean and corn are not similarly affected since these crops could be planted much later than cotton. Further selection of AAMU early maturing lines for uniform performance is in order. It must be noted that early maaturing lines are vulnerable to early freeze whilst late maturing lines could be subject to heat stress at flowering stage.**

***Minimal modification or retooling* of planting and harvesting equipment and machineries is required when shifting to canola production.**

***Farmer education via training workshops, field days and demonstration plots* - Outreach and farmer education through experimental on-farm demonstration and dissemination of information on various aspects of canola production, including planting date, fertilization, crop rotation, harvest methods, seed processing (from seed to oil), etc. A partnership among educators/researchers, farmers, industries and extension personnel improve data gathering, communication and technology transfer to endusers.**

***Harvest aids for uniform maturity and reduced seed loss from pod shattering* – Because canola seeds differentially mature, seed treatments to render uniform seed maturity at harvest become necessary. Contact herbicides (harvest aids) such as Reglone (glyphosate) are applied on canola to even out the crop and facilitate harvest. Application is recommended when 65-70% of seeds turned brown. Comparison with other herbicides including Roundup and 2,4D may reveal promising results. Pod-Ceal can help reduce pod shattering.**

CONCLUSIONS

Market remains the biggest challenge for canola farmers in the region. Farmers must be able to sell canola seeds at a competitive price locally. With lack of available processing plants near operational farms, it has become more important for farmers to locate seed buyer prior to committing agricultural acreages to canola production.