VIRGINIA SOYBEAN BOARD PROJECT PROPOSAL – FY2012/2013

ONE-PAGE SUMMARY

PROJECT NAME: Intensive Soybean Production Systems

TERM OF PROJECT: July 1, 2012 – June 30, 2013

COOPERATOR: David L. Holshouser
Associate Professor & Extension Agronomist

LOCATION: Virginia Tech - Tidewater Agricultural Research & Extension Center
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TOTAL COST OF PROJECT: $128,000

FUNDS REQUESTED: $55,039 (43% of total cost of project)

PROJECT GOALS:

1. Increase early-season growth and yield of double-cropped soybean
2. Increase acres of winter cover crops and to achieve sustainable conservation through cover crops.
3. Provide unbiased and timely variety selection information via the official variety tests (OVT), the publication, "Virginia Soybean Variety Information", and on-farm testing. Focus will be on varieties with new traits (e.g., RR2Y, LL, etc.).
4. Cooperate and assist County Extension Agents, Extension Specialists, Certified Crop Advisers, the Virginia Soybean Association, and the Virginia Soybean Board to accomplish their mission and goals that support Virginia soybean producers.

EXPECTED RESULTS: Agronomic inputs that result in greater double-crop soybean yields will be determined. Best methods to establish cover crops after soybean will be determined. Oat and rye cover crops before soybean planting will be contrasted. Soybean producers will select the best varieties and implement cultural and pest management practices that maximize economic returns. Communication between those involved with Virginia soybean production will improve.

ESTIMATED WORTH: Increasing double-crop soybean yields 5% per year would increase the value of Virginia's soybean crop by over $4 million per year. Improving cover crop diversity should enhance soil productivity and simplifying cover crop establishment so as to increase use will ease the burden of regulatory requirements. Choosing the proper soybean variety can increase yields by 5 to 10%. A worth of a well-trained and knowledgeable Cooperative Extension workforce is vital.

PROJECT PROPOSAL
TO
THE VIRGINIA SOYBEAN BOARD

Title: Intensive Soybean Production Systems

Cooperator: David Holshouser, Assoc. Professor & Extension Agronomist
Virginia Tech – Tidewater AREC
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Suffolk, VA 23437
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Virginia Soybean Production

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Goal and Objectives:

The goal of this research and extension project is to review, define, investigate, and put into practice the practices necessary for maximum economic soybean yield. This will require a review and revision of current recommendations, investigation of new technologies and production practices, and implementation of these best management practices. Specific objective for 2012-2013 are listed below.

1. Increase early-season growth and yield of double-cropped soybean.
   a. Determine the influence of soybean growth habit, plant population density, seed applied liquid inoculant, foliar-applied fungicide, UAN at planting, and their interactions on vegetative growth and yield.
   b. Evaluate vegetative growth response and yield with starter fertilizer and *Bradyrhizobia japonicum* inoculation.
   c. Evaluate the effect of fungicide application on disease incidence, yield, and seed quality.
2. Increase acres of winter cover crops and to achieve sustainable conservation through cover crops.
   a. Evaluate potential cover crop species that are most adaptable to interseeding into soybean cash crops
   b. Evaluate the time of cover crop interseeding with and without soybean defoliation on the success of interseeding
   c. Evaluate various soil and/or residue management techniques to increase germination and stand of interseeded cover crops.
   d. Evaluate soybean planting date and maturity group and cover crop seeding method on establishment and growth of cover crops.

   e. Evaluate soybean variety response to rye and oat cover crop planting date.

3. Provide unbiased and timely variety selection information via the official variety tests (OVT), the publication, "Virginia Soybean Variety Information", and on-farm testing. Focus will be on varieties with new traits (e.g., RR2Y, LL, etc.).
4. Cooperate and assist County Extension Agents, Extension Specialists, Certified Crop Advisers, the Virginia Soybean Association, and the Virginia Soybean Board to accomplish their mission and goals that support Virginia soybean producers.

Significance of Project:

Virginia's 540,000 harvested acres of soybean are estimated to average 39 bushels per acre (USDA Agric. Statistics Service) resulting in production of 21.5 million bushels and worth over $230 million. This makes Virginia's soybean crop the largest acreage and most valuable row crop.

Full-season soybean and double-cropped small grain-soybean are common cropping systems in the Mid-Atlantic USA. Full-season soybean yields more than soybean double-cropped after wheat, but soybean grown after barley yields similar to full-season soybean. Regardless of soybean yield, double-cropped small grain-soybean systems as a whole were more profitable than full-season soybean in Kansas, Mississippi, and Virginia. In addition to greater profitability, double-cropping systems provide additional environmental benefits by providing winter cover that reduces offsite soil and nutrient movement and by utilizing nutrients that were unused by the previous summer crop, which could otherwise leach into groundwater. Finally, double cropping soybean after small grain production allows for more total grain production in a time when global demand is increasing. Although benefits of double-cropping are clear, it is necessary to continue annual yield improvement with this system. Several issues put double-cropped soybean at a disadvantage over full-season systems. Global warming or stresses resulting from increasing temperatures may put double-cropped soybean at a disadvantage, as most of this crop's early-season growth will occur during the warmest times of the season. Pest management practices for double-cropped soybean may need re-evaluation since this crop will mature later in the year when incidence of insect pests and disease is greater. Breeders may have unknowingly selected for traits (related or unrelated to environmental changes) that favor full-season production systems. If so, such traits must be identified and better understood. Finally, new ideas to increase crop growth rate in the vegetative stages and extend the seed filling period (recognized as a problem in double-cropping systems) are needed to ensure adequate leaf area development and light capture.

Proposed strategies to clean up and improve water quality of the Chesapeake Bay will directly affect Virginia's agricultural industry. While this project cannot address the political matters reserved for agricultural associations, it can attend to production matters that may ease the effects of new regulations. Since soils testing high and very high in certain nutrients are a concern, production practices that increase yield, hence removing more of these nutrients, should be of great importance. Additionally, winter cover crops are one of the main tools that will be relied upon in the coming years to help meet water quality goals. Cover crop plantings will need to expand by over 100,000 acres annually to help meet the agreed upon goals. However, the incrementally "easiest" acres, those that lend themselves to cover cropping, are likely already enrolled in the program. Thus, a dramatic increase in acreage is going to require adaptation and innovation of the current cover crop systems so that they offer greater flexibility and greater appeal.

Soybean production entered a new era in the mid-1990's with the introduction of genetically engineered soybeans carrying the glyphosate-resistance trait. Although yields were reduced (yield drag) from the introduction of the gene, renewed interest and investment in private breeding programs, due to new legal agreements preventing growers from saving seed, have led to better high-yielding varieties. This upward trend in yields will likely continue. New traits instilling new mechanisms of herbicide, disease, and nematode resistance are also coming into the market. While many of the new production techniques and products have advantages and may result in greater profitability (if yield is increased or yield loss from pests is prevented), there is a need to evaluate all strategies before recommendations can be altered.

As Extension Agronomist, I extend knowledge and understanding to others by 1) observing current practices and listening to concerns, 2) improving the meaning and application of and simplifying scientific principles and research, and 3) guiding the implementation of improved production practices through education and demonstration so to change behavior that leads to profitable and environmentally responsible agriculture. To accomplish these goals, cooperation with all involved in agriculture is needed; farmers, grower associations, agricultural suppliers, crop advisers, county agents, researchers, and specialists must all work together. Effective technology transfer includes educational meetings, on-farm research and demonstration projects, field days, and effective communication methods. Virginia Cooperative Extension must be at the forefront of such activities; therefore, knowledgeable and experienced county agents and specialists is necessary.

Background, Prior and Current Research, and Extension Efforts:

Below are a review of some specific efforts relating to the proposed goals:

<u>Increase early-season growth and yield of double-cropped soybean.</u> Dr. Egli from the University of Kentucky evaluated the role of time in agricultural productivity and concluded that crops with longer growing seasons produce more biomass and those with longer seed-filling periods produce more seed yield. Delayed planting, resulting in a shorter growing season, is therefore largely responsible for the lower yields with double-cropped soybean. Researchers attributed yield reduction of late planted, double-crop soybean to a lack of sufficient vegetative growth. Kentucky research indicated that genetic yield improvement of short-season cultivars used was mainly associated with longer leaf area duration, which resulted in greater dry matter accumulation. In Virginia, we found that soybean needs to capture 95% of light or obtain a leaf area index (LAI) of 3.5 to 4.0 before pod filling. Increasing leaf area to improve light interception is the primary reason for greater yields in late-planted soybean. Therefore, increasing early growth of double-cropped soybean should increase yield.

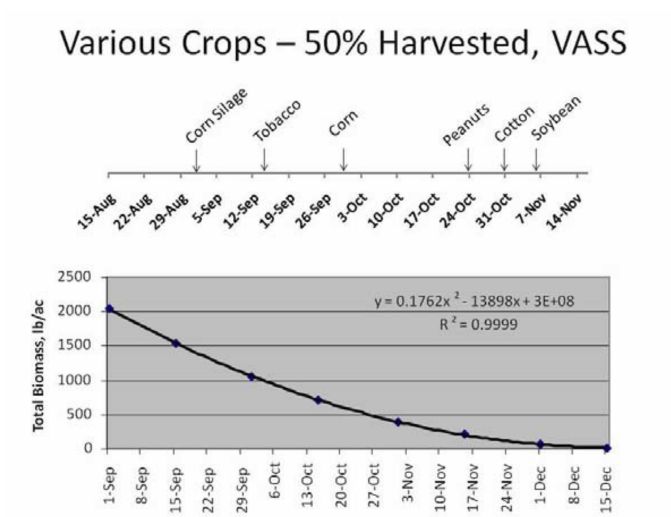
Aside from variety selection, earlier planting dates, and spatial arrangement alterations (i.e., row spacing, plant population, stand uniformity), few other attempts have been made to increase early-season growth in late-planted soybean. Soybean depends on a symbiotic relationship with the soil bacteria Bradyrhizobia japonica to provide for its nitrogen (N) needs. Still, several studies have found an increase and dry matter and yield with N applications. Others found no or negative responses. Research published in 2005 found that 60 to 70 kg ha-1 of N broadcast immediately after planting maximized yield and R1 (beginning flower) dry matter accumulation in late-planted (but not double-cropped) soybean. Nitrogen application did reduce nodule number and mass; therefore care must be taken to not harm this important N-fixing mechanism. With the exception mentioned above, none of the referenced studies were conducted in late-planted studies and none were conducted with soybean planted after a small grain. Furthermore, little research has been conducted that investigated the effect of inoculating seed with Bradyrhizobia japonica bacteria in double-cropped soybean.

Documented yield loss caused by foliar pathogens in soybean is infrequent. However, application of fungicide to soybean has increased yields in some cases, but results have been mixed. Some studies have shown yield increases, while others reported no response. Some have suggested a possible yield benefit due to a physiological effect of the fungicide on plants. Such physiological effects include increased chlorophyll content, leaf greenness, and photosynthetic rates, better water use efficiency, and delayed senescence. Little information is available documenting yield advantages of fungicides for double-cropped soybean, although soybean in this cropping system matures later in the year when disease incidence is usually greater. Furthermore, the effect of disease prevention has not been adequately separated from potential physiological effects.

To summarize, there is a need to evaluate methods to increase early growth and yield of double-cropped soybean. Vegetative response to N and inoculation, and the potential yield response to foliar fungicides of double-cropped soybean need investigation. In addition, a better understanding of how such practices interact with other proven leaf area/biomass-increasing tactics (plant population, variety selection) is needed.

<u>Increase acres of winter cover crops and to achieve sustainable conservation through cover crops.</u>
Improved water quality, including the role of agriculture in maintaining water quality, in the Chesapeake Bay has been a long-term concern in Virginia and other Mid-Atlantic states. In 2010, President Obama issued Executive Order 13508 that outlines strategies and goals for reaching water quality goals in the Chesapeake Bay. In section 202(b) of the Executive Order, agriculture is credited with reaching 50% of its targeted pollution (N, P, and sediment) reduction goal, but broader and more cohesive efforts, including accelerating conservation adoption and new technologies, are called for. Virginia has identified five agricultural best management practices (BMPs) that will most effectively enable the state to reach the necessary pollution reductions and one of these is winter cover crops. The Commonwealth currently estimates that cover crops are planted on 119,000 acres (Chesapeake Bay Milestones Report, 2009). The Milestones report calls for a further N load reduction of 1 million pounds. It is evident that the number of acres planted to N scavenging cover crops will need to increase dramatically to meet this goal. However, the incrementally “easiest” acres, those that lend themselves to cover cropping, are likely already enrolled in the program. Thus, a dramatic increase in acreage is going to require adaptation and innovation of the current cover crop

Fig. 1. Five-year average date of 50% harvest completion for various row crops and estimated rye cover crop DM biomass by fall planting date.



systems so that they offer greater flexibility and greater appeal. Seasonality of cash crop harvest is one major issue slowing the expansion of cover crops (Fig. 1). While corn silage, tobacco, and corn for grain are typically harvested in time to successfully plant a winter annual crop, harvest is always delayed on some of these acres. Similarly, harvest dates for soybeans are often too late for conventional seeding of winter annuals. In these cases, the most feasible approach is to broadcast seed into the standing crop to establish the cover crop in the cash crop well before harvest (intercropping). This facilitates seeding at earlier dates and greater likelihood of accumulating the heat units necessary to get a winter annual cover off to a good start, but also increases the risk of failure because conventional seeding equipment cannot be used. Broadcasting, either via ground or aerial application, does not ensure good seed to soil contact which is considered essential to planting success. Broadcasting can work, and work well, but a greater understanding of the conditions under which successful stands are established is needed before more widespread adoption. Similarly, little is known about management techniques that could be employed to increase the likelihood of seeding success. There is generally less information of cover crops as related to soybean. Rye is largely regarded as the best cover crop preceding soybeans due to its growth and ground cover advantages. However, rye can harbor wheat and barley diseases, making this a potential problem for future small grain-soybean systems. Oats, on the other hand, may be a more suitable cover crop for managing pests and has greater early-fall growth. Information is needed on the effect of rye and oats on soybean growth, development, and yield. In summary, winter annual cover crops can contribute to achieving water quality goals and that improving the success of interseeded cover crops will broaden the appeal and adoption of cover crops in Virginia.

<u>Soybean Variety Testing.</u> Each year, approximately 100 soybean varieties are tested in the OVT at 5 full-season and 5 double-crop locations. This testing will continue. Continued emphasis is needed on new Roundup Ready 2 Yield, Liberty-Link, and other similar varieties to determine if yield claims are justified. In 2010, data did not reveal a clear advantage of one trait over another. However, 2011 data indicated that RR2Y varieties tended to be the highest yielding. However, it is still recommended that growers make variety selection based on individual variety characteristics and yield data, and not the trait.

<u>Cooperation with Agents, Specialists, Crop Advisers, and Boards.</u> Better communication insures excellence in technology transfer. Strong relationships with farmers, county agents, and agribusiness can be enhanced through continued cooperation on research projects and on-farm demonstrations that give local confirmation and evaluation of research and extension recommendations. Local programming efforts via area meetings and field days also increase the effectiveness of soybean information delivery. Effort to improve internet and electronic means of distributing information and training should better utilize limited funding. New social media web sites (Facebook, Twitter, blogs) related to Virginia soybeans have been established and will be integrated with traditional means of communication. Continued service as educational advisor to the Virginia Soybean Association and Virginia Soybean Board allows the inclusion of the Association's goals when planning research and extension programs.

Virginia Cooperative Extension is growing stronger. Virginia will have 8 to 10 new agriculture and natural resource agents in place for the 2011 growing season. These agents must be well-versed in all modern production practices; therefore, immediate and intensive training is needed.

Plan of Work:

An effective applied research and extension program develops new knowledge and understanding, efficiently delivers it to users, and serves as a catalyst for change that increases profitability. Soybean production recommendations need to be continually refined with new data and technology. A new 8-foot Great Plains drill was purchased two years ago with the assistance of the College of Agriculture and Life Sciences. This drill may eventually be outfitted with the cone seeding system that is on the current plot planter. It can also be used for cover crops demonstrations and research throughout Virginia. However, before that can happen, a new tractor with sufficient lift capacity and a larger trailer to transport the equipment will be needed. A request was made to the CALS this fall and again this spring to cost-share a new tractor. Other equipment needs include soil moisture sensors that can be easily moved from field to field. Finally, the project will need assistance with tuition for Mr. Kevin Dillon, a new PhD student and recipient of the United Soybean Board Graduate Fellowship.

Details of each objective for this project can be found below.

1. Increase early-season growth and yield of double-cropped soybean.

   a. Determine the influence of soybean growth habit, plant population density, seed-applied liquid inoculant, foliar-applied fungicide, UAN at planting, and their interactions on vegetative growth and yield.

      Field studies will be conducted at the Eastern Virginia, Eastern Shore, Southern Piedmont, and/or Tidewater ARECs and at on-farm locations. The studies will be conducted as a split-plot arrangement of treatments in a randomized complete block design replicated four times. Factors tested will be soybean variety growth habit (indeterminate versus determinate), seeding rate, seed-applied liquid inoculant, foliar fungicide application, and UAN application at planting. Main plots will be fungicide application to allow for more accurate and uniform application. Pioneer Hi-Bred Int. Intl. varieties 95Y01 indeterminate or 95Y20 determinate soybean varieties will be planted. Seeding rates of 240,000 or 290,000 seeds/acre will be utilized to obtain a soybean plant population of 180,000 or 220,000 plants/acre. Optimize liquid inoculant will be applied the day before planting to half of the plots. Foliar fungicide will be applied to half of the plots at the R3 and R5 soybean development stages with a tractor-mounted sprayer. Application of UAN solution of 28-0-0-6S will be injected directly after planting at 8 gallons/acre. Plots will be five 15 inch rows in width and 17 feet in length.

      Stand counts will be collected 4 weeks after planting to determine plant population. Soil samples will be collected at planting to determine soil nutrient status and texture analysis. Plant tissue samples will be collected later in growing season to determine treatment effects on nutrient levels within the soybean plant. Leaf area index (LAI) and the normalized vegetative difference index (NDVI) will be calculated when soybean reach the R3 and R5 development stages. Soybean will be harvested at full maturity with a Wintersteiger® small plot research combine and seed yield in kg ha-1 will be determined. In addition, a 1-meter section of row will be harvested to determine total dry weight, final plant stand, nodes/plant, fertile nodes/plant, tiller number, pod number, and seed number. Seed weights will be calculated after harvest by weighing 100 seed and seed/pod will be calculated. Data will be analyzed with appropriate statistical techniques.

b. Evaluate vegetative growth response and yield with starter fertilizer and *Bradyrhizobia japonicum* inoculation.

Field experiments will be conducted at diverse locations representing contrasting Coastal Plain and Piedmont soil types. Experimental design will be a randomized complete block with four replications. A factorial arrangement of seed inoculated with and without *Bradyrhizobia japonicum* and five N rates of 0, 12.5, 25, 37.5, and 50 lbs N/acre. Seed will be inoculated within 24 to 48 hours prior to planting. Nitrogen will be applied injecting the solution 2 to 3 inches below the soil surface and 2 to 3 inches away from the row. N-[n-butyl] thophosphoric triamide, a urease inhibitor, will be added to the N solution to inhibit volatilization. Immediately before planting, soil samples (20 to 30 cores, 2.5-cm diameter; 0 to 15-cm and 15 to 30-cm depths) will be collected in each replication of the main plots to determine nitrate N (NO3) concentrations. At the V4 (5 true leaves), V8 (8 true leaves), R2 (full flower), and R5 (beginning seed) development stages, height, LAI, and dry matter measurements and tissue samples will be collected from a 1-m of row. Tissue samples will be analyzed for available nutrients with N being of particular interest. Also at the above soybean development stages, root samples will be taken with an 8-cm diameter core barrel to a depth of 20 cm. Root samples will be washed and nodule number and dry weight determined. At maturity, seed yield (adjusted to 13% moisture), protein and oil content (dry matter basis), seed weight (g 100 seed-1), and seed quality (visually rated on scale of 1 = good quality to 5 = poor quality) will be determined. Data will be subjected to appropriate statistical analysis techniques.

c. Evaluate the effect of fungicide application on disease incidence, yield, and seed quality.

Experiments will be conducted at several locations through Virginia on double-cropped soybean. Experimental design will be a randomized complete block with 4 replications. To facilitate planting multiple cultivars and insure more uniform fungicide application, plots will be arranged as a strip-plot. Vertical plots will be cultivars with varying maturities and disease resistance. Horizontal plots will be an untreated control and fungicide treatments at the R3 (beginning pod), R5 (beginning seed), or R3 + R5 soybean development stages. Stobilurin-based fungicides will be used. Beginning at full flower (R2 stage), bi-weekly measurements of leaf area index (LAI) will be taken and leaf chlorophyll will be monitored with a chlorophyll meter. Disease incidence will also be assessed for each plot at these times. Common diseases may include but not be limited to septoria brown spot (Septoria glycines), cercospora leaf spot (Cercospora kikuchii), and frogeye leaf spot (Cercospora sojina). Beginning at the mid-R6 stage (full-seed), percent defoliation will be visually rated every week until full maturity (R8 stage). Seed yield, seed moisture, plant height, and lodging will be measured at harvest. Data will be analyzed with appropriate statistical techniques.

2. Increase acres of winter cover crops and to achieve sustainable conservation through cover crops.

a. Evaluate potential cover crop species that are most adaptable to interseeding into soybean cash crops.

Cover crop species interseeding trials will be conducted at three diverse locations in Virginia. When soybeans reach approximately 25% leaf drop (R6.75 growth stage), the following cover crops will be broadcast into the soybean canopy: 1) rye, 2) barley, 3) spring oats, 4) rye + hairy vetch, 5) rye + tillage radish, or 6) spring oats + tillage radish. In early winter percent ground cover will be estimated for all species. Experiments will use a randomized complete block design with four replications. Aboveground biomass will be determined from a 0.5 m-2 area. Digital photographs will be taken from each treatment at this time for inclusion in presentations and fact sheets as well as analysis via VegMeasurement software. Total C and N determined by dry combustion. Nitrogen uptake will be determined as the product of dry matter yield and tissue N concentration. Similarly, all aboveground biomass will be hand clipped from a 0.5 m-2 area in each treatment just prior to killing the cover crop. Cover crop dry matter will be determined as well as total C and N. To evaluate species growth rate response to temperature, each entry tested in the previous studies, will also be germinated under controlled environmental conditions in growth chambers on the Virginia Tech campus. Phenological development will be recorded and a "growth curve" developed for each species. This will allow fall and winter growth to be estimated throughout the Commonwealth in response to long-term average temperatures. Recommended planting date ranges can then be developed by species and the most effected species for a cropping system can be targeted based on growth and development

b. Evaluate the time of cover crop interseeding with and without soybean defoliation on the success of interseeding.

   At the R6.5 growth stage (full seed; 10 days after R6; 80% of yield made) and R7 (physiological maturity; approximately 2/3 of leaves have fallen; 100% of yield made) of soybeans, rye at a rate of 1.5 bu/ac will be broadcast into the crop canopy. One treatment will be sprayed with paraquat, while one will remain untreated and leaves will senesce naturally. The study will be conducted in a randomized complete block design, with the six treatments listed in objective 1 and four replications in plots of approximately 400 sq. ft. each. In early winter, percent ground cover will be estimated for all treatments. Similar to the methods in objective 1, we will measure ground cover, biomass, and take digital photos from each demonstration area. Total C and N will be determined from these samples and uptake calculated.

c. Evaluate various soil and/or residue management techniques to increase germination and stand of interseeded cover crops.

   It is apparent that to expand cover cropping systems to greater acreages, alternative seeding practices, such as interseeding into standing soybeans, must be refined and recommendations to improve success be developed.. Since most of these late-maturing acres will be soybeans planted double-crop behind small grains, how we manage the small grain stubble could influence the success of this interseeded cover crop. To that end, after small grain harvest and before (or just after) soybean planting, four straw management treatments will be imposed, then soybean planted on the entire area. The four treatments will be: 1) stubble left standing; 2) stubble removed as if baled for hay; 3) stubble vertically tilled (e.g., TurboTill); and 4) stubble lightly incorporated. At the R7 growth stage of soybeans, rye at a rate of 1.5 bu/ac will be broadcast into the crop canopy. In early winter percent ground cover will be estimated from all plots. Aboveground biomass will be hand clipped from a 0.5 m-2 area in each comparative demonstration at this time and crop samples will be dried to determine dry matter yield. Digital photographs will be taken from each treatment at this time as well.

d. Evaluate soybean planting date and maturity group and cover crop seeding method on establishment and growth of cover crops.

   A MG III, IV, or V soybean will be planted in April, May, and June of 2011. When soybean reaches the R6.5 to R7 stages, the cover crop will be aerially seeded to half of the plots. After harvest, the cover crop will be drilled into the other half of the plot. The experimental design is a split strip-plot with maturity group as main plots and planting date and cover crop seeding method as vertical and horizontal plots within the main plot. Similar methods employed in the previous objectives will be used for evaluating cover crops.

e. Evaluate soybean variety response to rye and oat cover crop planting date.

   Rye and oat cover crops will be planted in the fall of 2011 in a randomized complete block design, which will also include a fallow treatment at three different planting dates. In the spring of 2012, cover crops will be killed with herbicide at two or three different planting dates. Biomass will be harvested and weighed from a subsample in each plot. Nutrient utilization/recycling will be calculated based on the biomass data. Several representative soybean varieties will be no-till planted in 7.5- or 15-inch rows. Stand counts, growth measurements, and yield will be taken throughout the season to evaluate the effect of the covers on soybean. Soybean yield will be determined and data will be analyzed with appropriate statistical techniques.

   To summarize our cover crop efforts, we will develop a greater understanding of the techniques that increase success of interseeding cover crops into standing soybeans and develop recommendations for this practice. We will also better determine the most appropriate cover crop to use before full-season soybean. Field days will be planned at two or more demonstration sites annually.

3. Provide unbiased and timely variety selection information via the official variety tests (OVT), the publication, "Virginia Soybean Variety Information", and on-farm testing. Focus will be on varieties with new traits (e.g., RR2Y, LL, etc.).

   Full-season and double-crop tests will be conducted in the Northern Piedmont (Orange/Culpeper/Madison), Southern Piedmont (Blackstone or Mecklenburg), Northern Coastal Plain (Warsaw), Southern Coastal Plain (Suffolk), and Eastern Shore (Painter) regions. The data will be combined with previous year's data for a multi-year analysis. Data will be made available via electronic means as soon as possible. Yield summaries will be available via the internet by January and a full report will be available by February 1. Hard copies of the reports can be distributed via county offices and at local meetings. The publication, "Virginia Soybean Variety Information", which includes multi-year summaries, will be made available by early February.

4. Cooperate and assist County Extension Agents, Extension Specialists, Certified Crop Advisers, the Virginia Soybean Association, and the Virginia Soybean Board to accomplish their mission and goals that support Virginia soybean producers.

   Extension programs will include presentations at local and regional meetings and field days. On-farm testing will continue. Attention will be given to bringing all new county agents up to speed with current agronomic practices. My goal is that ANR agents will receive the education necessary to enable them to deliver high quality, impactful programs. Thererfore, I and other specialists will develop and deliver classroom, field and interactive webinar in-service training programs. My benchmark is that 75% of ANR County Agents and 90% of recent hires with crops and soils responsibilities will have participated in 1 classroom and 1 field service training program each year. Additionally, I will provide training to crop advisors as requested in the Mid-Atlantic region. The 2012 Virginia Ag Expo will be in Hanover County, VA. I will support the Board and Association in any way requested.

Budget

BUDGET CATEGORY	FUNDS REQUESTED
PERSONNEL (LABOR)	
Classified Staff:	
Mr. Ernest M. Ellis	$15,317
Ms. Patricia Lewis	10,126
Classified Benefits (FY011/12 = 37.75%)	9,796
Part-time Wage	7,123
Wage Benefits (FY11/12 = 7.5%)	677
PERSONNEL (LABOR): SUB-TOTAL	$ 43,039
TRAVEL To and from plot and extension meetings; to attend the 2012 Commodity Classic	$3,000
MATERIALS AND SUPPLIES Expendable supplies (fertilizer, flags, stakes, soil moisture probes, diesel fuel, etc.)	$7,500
CONTRACTUAL SERVICES (Plot combine service & repair)	$1,500
PROJECT TOTAL	$55,039

*ONR negotiated rates for Virginia Tech

The following personnel will be involved in this project:

Dr. David L. Holshouser, Soybean Specialist
Mr. E. Michael Ellis, Agricultural Technician
Ms. Patsy Lewis, Agricultural Technician
Secretarial assistance

Budget Justification:

Salary and wage funds will be used to support planting, cultivation, harvest, and laboratory measurements of soybean experiments. Approximately 50 and 42% of the salaries of Tidewater AREC employees, Mr. Ernest M. Ellis (Agricultural Supervisor) and Ms. Patricia Lewis (Agricultural Technician A) will be supported by this project. Wage funds will be used to support the summer employment of a wage employee (TBA).

Travel funds will be used to attend the 2012 Commodity Classic and/or other professional conferences and for travel to and from local meetings, conferences, and research plots.

Material and supply funds will be used to purchase fertilizer, agricultural chemical, plot supplies, and/or fuel.

Contractual services include funds to service and repair a plot combine.