



20-05

NEW PROPOSAL

- 1 **TITLE:** Controlling JGG in 2-gene Clearfield Wheat with Preplant Herbicides.
2. **PERSONNEL:** Case Medlin and Tom Peeper. Oklahoma State University, Stillwater, OK
3. **TIME LINE:** Project will begin after wheat harvest in June 2006 and end when data collected from the 2006-07 wheat crop is analyzed and reported, in the winter of 2007.
4. **HYPOTHESIS:** Our earlier research has shown that certain Group 2 herbicides applied during the summer months between wheat crops effectively controlled weeds during the summer, but killed fall seeded wheat. Back at that time, we did not have Clearfield wheat. With the introduction of 2-gene Clearfield wheat, it seems only logical to revisit this approach. Data indicate that effective residual JGG control could be obtained, if the 2-gene wheat will tolerate the residual IMI herbicides.
5. **SUMMARY OF PROPOSAL:** Our proposal is simply to apply selected Group 2 herbicides at a range of rates to wheat stubble after harvest in 2006, observe their efficacy during the summer, plant 2-gene Clearfield winter wheat in the fall of 2007 and determine the effect on the wheat and level of control of JGG with those treatments.
6. **OBJECTIVES:** Determine whether we can effectively control JGG in 2-gene Clearfield winter wheat by applying residual IMI herbicides to wheat fields during the summer.
7. **JUSTIFICATION:** Current Clearfield technology and Beyond herbicide have not proven successful in Oklahoma, as evidenced by the declining sales and acceptance of Clearfield wheat by growers. Development of 2-gene wheat will help alleviate concerns about potential crop injury, but will not overcome the primary concern, i.e. lack of weed control with Beyond. Since Beyond seems to be somewhat non rate responsive, we do not anticipate that increasing application rates will improve weed control to the levels needed for commercial acceptance. Thus, another approach to utilization of this technology is needed. We have learned from previous research that residual IMI herbicides were very effective in controlling weeds between wheat crops in a continuous wheat system. However, we had no wheat varieties at that time that could survive the residual activity of these herbicides. With 2-gene Clearfield winter wheat, we need to determine whether we can apply these herbicides and get summer weed control plus control of fall emerging weeds. We think that this is exactly what will happen, and this would be a big boost for our no-till farmers as well as conventional tillage growers with JGG problems.

8. **METHODS:** Replicated (3 reps) field experiments will be established under controlled conditions at two sites on research stations and one site on a farmer's wheat field. Approximately 12 herbicide treatments will be applied soon after harvest in 2006. Herbicides investigated will include imazapyr, imazaquin, imazapic, imazethapyr, and some long residual SUs that are not typically used in wheat. Rates will not exceed labeled rates for other uses. Effects on summer weeds will be visually estimated. JGG densities will be counted prior to seeding and after heading. 2-gene Clearfield winter wheat will be seeded in late September or early October, depending on moisture conditions, and the response of the wheat and JGG will be determined. To insure that plenty of JGG is present, JGG spikelets will be overseeded and incorporated into the soil at the sites on the research stations. Plots will be harvested in June 2007 and JGG spikelet content of the wheat determined. All data will be analyzed using ANOVA and other appropriate statistical procedures. The data will be used to determine further research and technology transfer needs for this approach. We anticipate that the first years' results will allow us to home in on the best herbicides and rates for further evaluation.

9. **LITERATURE CITED:** Heering, David C. and Thomas F. Peeper. 1991. Field bindweed (*Convolvulus arvensis*) control in winter wheat with herbicides. *Weed Technology* 5:411-415.

10. **PLANNED TECHNOLOGY TRANSFER.** In Oklahoma, wheat growers like to walk fields and look at results on their neighbors fields. Therefore, we propose to establish one of the sites on a wheat growers field in northwest OK, in the area where JGG is of the greatest concern. This will allow us to demonstrate results to wheat growers in that area, who in turn will be able to give us feedback about what they perceive as advantages and possible disadvantages of the proposed approach. These inputs will be valuable to us in planning further activities. Also, we will show a duplicate set of plots to growers who attend the annual wheat tour at the Northcentral Research Station at Lahoma, OK in May 2007. Growers in that area are particularly anti-Clearfield, (as Tony White found out first hand when speaking to them) and we need to be able to demonstrate to them that this technology could have advantages for them.

11. **BUDGET:** We are requesting \$20,923 for FY-2006.

The proposed budget is attached. The budget requests funds for 5/12 of a temporary Senior Agriculturist to conduct the research, funds for travel including mileage charges for driving OSU vehicles to and from the research sites, partial travel expenses for attending the annual project review meeting, and some funds for research supplies. It is basically a bare bones budget and is for only one year. IF there is funding available next year, we will prepare a new proposal for a second year funding, in order to have a more thorough evaluation of the proposed approach to JGG control. We would anticipate that the second year request would be for a very similar amount as the first year request.

**12. Budget Justification**

- a. Salaries: Funds are requested for 5 months for a temporary Senior Agriculturist at an estimated salary of \$2200/month. This individual will be responsible for conducting all aspects of the research including seedbed preparation, establishment of the field experiments, herbicide treatment application, pest management activities, data collection, and final report preparation. Budget for this area = \$11,000.
- b. Fringe benefits are estimated at the current expected rate for FY 2007 of 38.02% for five months, for the Senior Agriculturist mentioned above. Total fringe benefits are thus estimated at \$4,182.

- c. Materials and Supplies: Materials and supplies costs are estimated as follows :
 

Fertilizer and lime-----	\$175
Plots markers and signs for field tours-----	\$100
Supplies for maintaining field research equipment (fuel, lube, minor maintenance)-----	\$200
Supplies for collecting and processing yield samples-----	\$175
Personal protective equipment required for pesticide applications-----	\$100
Crop seed -----	\$40
Weed seed -----	\$110
<u>Crop protection pesticides (insecticides and fungicides)and their application</u> -----	<u>\$100</u>
Total materials and supplies-----	\$1000

- d. Travel: Travel covers two types of expenses. First is the travel required to conduct the research at outlying research stations. The second type of travel is the travel required to present the progress report at the annual review meeting.
  - Type 1 travel:-- travel to three remote sites to conduct the field experiments. Estimated round trips required per site = 8. Estimated round trip distance 400 miles (assuming that more than one site can be visited in a single trip). Estimated cost per mile, based on current vehicle charges for a heavy duty pickup truck, as required to transport field research equipment = \$0.66/mile. Total for type 1 travel = \$2,400.
  - Type 2 travel: Travel to attend mandatory annual project review meeting, at Portland Oregon, including estimated airfare (\$500) and per diem (two days at \$50/day) = \$600

