policies implemented to protect or remove Buddleja. Although this work was reviewed by the USEPA and approved for publication, it may not necessarily reflect official Agency policy.

266. **Seedbank Dynamics and Depletion of *Commelina benghalensis* L. (Benghal Dayflower).** Michael Burton[1], Theodore Webster[2], Alan York[1]; [1]North Carolina State University, Raleigh, NC, United States of America; [2]USDA, Tifton, GA, United States of America

*Commelina benghalensis* L. (Benghal dayflower ) is listed as a USA federal noxious weed because of mulitiple herbicide tolerances (including glyphosate) and the potential for continuous germination and competition with crops, especially cotton and peanut. Rapid increase in the distribution of this species in the Southeastern USA has resulted in quarantines by state regulatory agencies and local eradication attempts. Some have suggested that *C. benghalensis* might be locally eradicated through seedbank depletion (i.e. destroying emerged plants before they reproduce) over a period of several years. Data to support such speculation is lacking. Consequently, seedbank longevity experiments were initiated in 2004 and 2005 in North Carolina (NC) and Georgia (GA), USA. Seeds (75 small and 25 large aerial seeds) from a NC Benghal dayflower population were mixed with screened native soil and sewn into plastic mesh bags. Sufficient bags were buried at 20 cm depth (at the bottom of the plow layer) to allow exhumation of four replicate bags every six months for several years. The experiment was replicated in NC by a parallel experiment (separate start year) in 2005 using seed from a GA population, and a similar experiment was initiated in 2005 in Tifton, GA, using seed from the same NC and GA seedlots. A separate set of experiments examining the survival of *C. benghalensis* seeds subjected to shallow burial (0 to 5 cm) was also initiated in NC. Treatments included annual and frequent cultivation and the presence/absence of a crop. Preliminary results of the deep burial experiments indicate that seed demise has occurred more rapidly in GA than in NC. After two years of deep burial, both NC and GA seed lots declined linearly to about 30% viability when buried in GA. However, the same seedlots had only declined to about 50% viability after 3 years of burial in NC. Frequent cultivation in the shallow burial experiment was the only treatment that stimulated germination/emergence of *C. benghalensis* in shallow depths with little apparent effect of crop presence until the 2007 drought year. While the early and rapid demise of the seedbank suggests rapid depletion might be possible, there are yet insufficient data to determine whether the linear trend will eventually transition to an exponential decay model. Difficulties in breaking dormancy for germination tests and difficulties with tetrazolium chloride staining continue to complicate interpretation of results.

267. **Weedy Rice Germination as Affected by Overwinter Temperatures and Water Conditions.** Aldo Ferrero[1], Silvia Fogliatto[1], Marco Milan[1], Francesco Vidotto[1]; [1]Agroselviter, Università di Torino, Grugliasco, To, Italy

Weedy rice (*Oryza sativa* L.) is one of the major weed issues in rice production worldwide. A large number of weedy rice populations have dormant seeds that do not germinate until the next spring.

Overwinter flooding of rice fields may promote weed seed depletion by attracting waterbirds and favoring suicidal germination during autumn. Information on dynamics of weedy rice seed dormancy during overwinter flooding can be usefully exploited for a rational control of the weed. The objectives of the study were to investigate the effect of temperature and water on seed germination and to assess the depletion of viable seeds present on soil surface after overwinter flooding.

The study was conducted in 2005-2008 with laboratory and field trials. In the laboratory trial, seeds of two weedy rice populations (awned and awnless), collected in the field, were maintained at constant -20 °C, + 5 °C, + 25 °C, or at field conditions. At each temperature regime, the seeds were stored either dry or immersed in water. Amounts of seeds were tested for germinability every 2 weeks up to about 200 days.

The field trial was carried out at two locations in Northwestern Italy. At each site, 3 paddy fields of at least 3 ha each were overwintered either in dry conditions, continuously flooded for up to 3 years or for up to 4 years. After harvesting and at the end of winter flooding, soil cores (12 cm diameter, 2-4 cm depth) were taken in different areas from each field and weedy rice seeds present on core top were counted.

Constant temperatures of seed storage resulted in variable germination patterns with no consistent correlations with populations and watering conditions. In simulated field conditions, both populations showed a consistent trend to lose dormancy during storage, especially in the case of storage in water. After 150 days of storage, germinability ranged from 78% (dry) to 90% (water) in the awnless population and from 26% (dry) to 85% (water) in the awned one. A fast increase of germinability was observed in all conditions starting from about 180 GDD (min. 8°C, max. 25°C).

In the field study, the weedy rice infestation recorded before seed dispersal averaged from 10.8 to 23.5 plants/$m^2$ at the two sites, and seed rain ranged from about 960 to 2100 seeds/$m^2$. Overwinter flooding always resulted in a reduction of the number of seeds on soil surface greater than 90%. In fields kept dry overwinter, a reduction ranging from 25 to 28% of the seed rain was also observed. The results obtained in laboratory conditions may in part explain those achieved in the field, as flooding may induce a significant number of seeds to germinate, thus exposing the seedlings to the rigors of winter.