A waterhemp population from southeast Nebraska has been confirmed to be resistant to 2,4-D herbicide.

The resistant population is believed to be limited to a few fields, but weed scientists are concerned because this is the sixth weed treatment to which waterhemp has become resistant.

“This is the first weed that’s had resistance to six modes of action in the United States,” said Mark Bernards, until recently a University of Nebraska-Lincoln Extension weed specialist who’s now at Western Illinois University.

UNL Extension received a report in 2009 of a warm-season grass field with a waterhemp population no longer controlled by 2,4-D. Extension specialists collected seed from the field in 2009 and 2010 and tested it, finding it was 10-fold more resistant to 2,4-D than other waterhemp populations.

Waterhemp is the predominant pigweed (Amaranthus) species in eastern and south central Nebraska fields and is problematic throughout much of the Corn Belt. It is well adapted to reduced tillage cropping systems that rely primarily on herbicides for weed control. Waterhemp has succeeded because it emerges from May through August, allowing late emerging plants to avoid herbicides.

In an article in UNL Extension’s Crop Watch newsletter, Greg Kruger, UNL Extension cropping systems specialist, and Bernards noted there is concern about waterhemp populations that become resistant to three or more herbicide types.

“When populations with multiple-herbicide resistance are then managed with the one or two remaining herbicide mechanisms-of-action that are still effective, the likelihood of the population evolving resistance to those herbicides is high,” they wrote.

The herbicide use pattern in the field where the resistant population was collected included an

annual burndown application of atrazine, metolachlor, and 2,4-D followed by a postemergence application of 2,4-D. Research is underway at UNL to determine whether this waterhemp population has developed resistance to additional herbicide mechanisms-of-action.

The findings have broad implications, Bernards said.

“New technologies that confer resistance to 2,4-D and dicamba are being developed to provide additional herbicide options for postemergence weed control in soybean and cotton, but the development of 2,4-D resistant waterhemp in this field is a reminder and a caution that these new technologies, if used as the primary tool to manage weeds already resistant to other herbicides such as glyphosate, atrazine or ALS-inhibitors, will eventually result in new herbicide resistant populations evolving. This will limit the value of those technologies to farmers,” he said.

To minimize the risk of developing herbicide-resistant weeds, they recommended:

rotating effective herbicide mechanisms of action,

tank-mixing multiple effective herbicides and

using effective doses.

Where possible, they added, it’s best to use an integrated weed management plan that also includes non-chemical weed control options such as crop rotation and tillage.

Farmers should carefully monitor fields for changes in susceptibility to the herbicides being used and contact a UNL Extension office when resistance is suspected.

If multiple plants survive in a field, and that species is known to have developed resistance elsewhere to herbicides used in that field, it may be prudent to remove the survivors before they produce seed.