



United States
Department of
Agriculture

National Institute
of Food and
Agriculture

Northeast Woody/Warm-season Biomass Consortium



Task 2: Feedstock Improvement for Perennial Energy Crops

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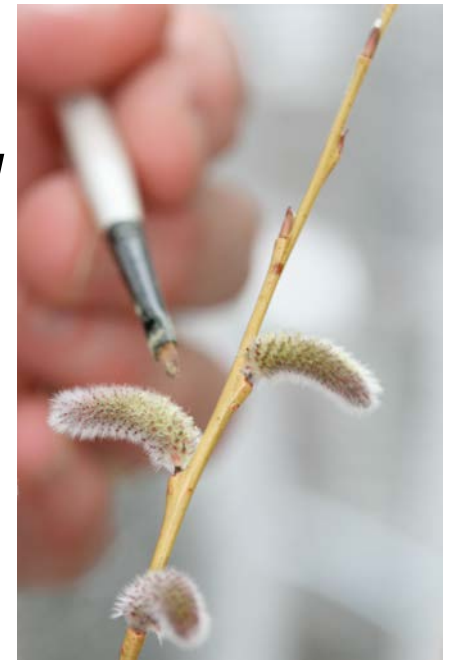
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Overall Aim:

Deliver cultivars with improved performance and expanded range on marginal lands, including reclaimed mine land





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Tasks to achieve our aim:

Task 2.1 *Breeding of non-invasive triploid hybrids of willow displaying hybrid vigor*

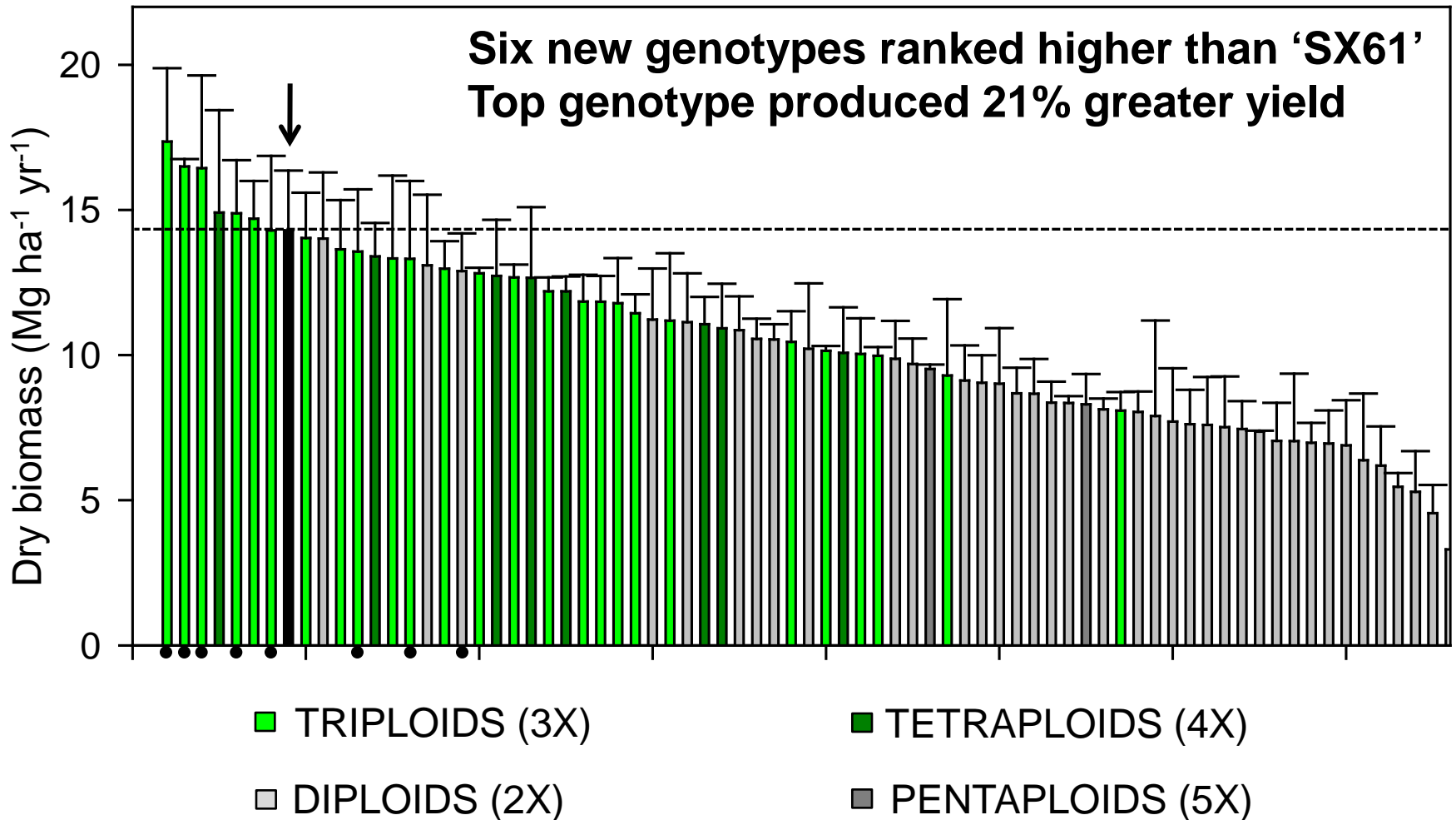
Task 2.2 *Genetic basis for pest and disease resistance in willow and perennial grasses*

Task 2.3 *Breeding and selection of cultivars adapted for NE conditions*

Task 2.4 *Breeding and selection of willow and switchgrass for yield on reclaimed mine land*

2008 Genetic Selection Trial - Geneva, NY

- 24-plant plots, 3 replicates, 76 genotypes
- Biomass harvested from middle 8 plants in Dec. 2011





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Achievements to Date:

Task 2.1 *Breeding of non-invasive triploid hybrids of willow displaying hybrid vigor*

- Attempted over 60 crosses
- Produced over 4,600 seedlings
- Of those, almost 1,000 are triploid
- Seedlings established in nursery beds in Geneva





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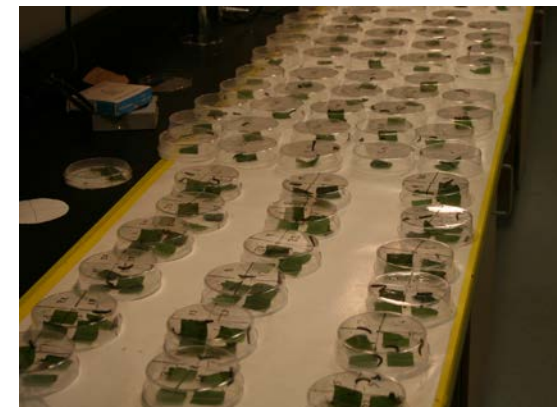
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Achievements to Date:

Task 2.2 *Genetic basis for pest and disease resistance in willow and perennial grasses*

- Switchgrass mapping population segregating for anthracnose resistance has been planted/rated
- Switchgrass fungicide/no fungicide trial planted at Rutgers
- Choice/no-choice pest feeding assays conducted on willow



Achievements to Date:

Task 2.3 *Breeding and selection of cultivars adapted for NE conditions*

- Willow yield trials planted at Willsboro, NY (poorly drained) and Fredonia, NY (low pH)
- Willow family selection trial planted in Geneva (284 entries)
- Switchgrass breeding nurseries established at Cornell & Rutgers



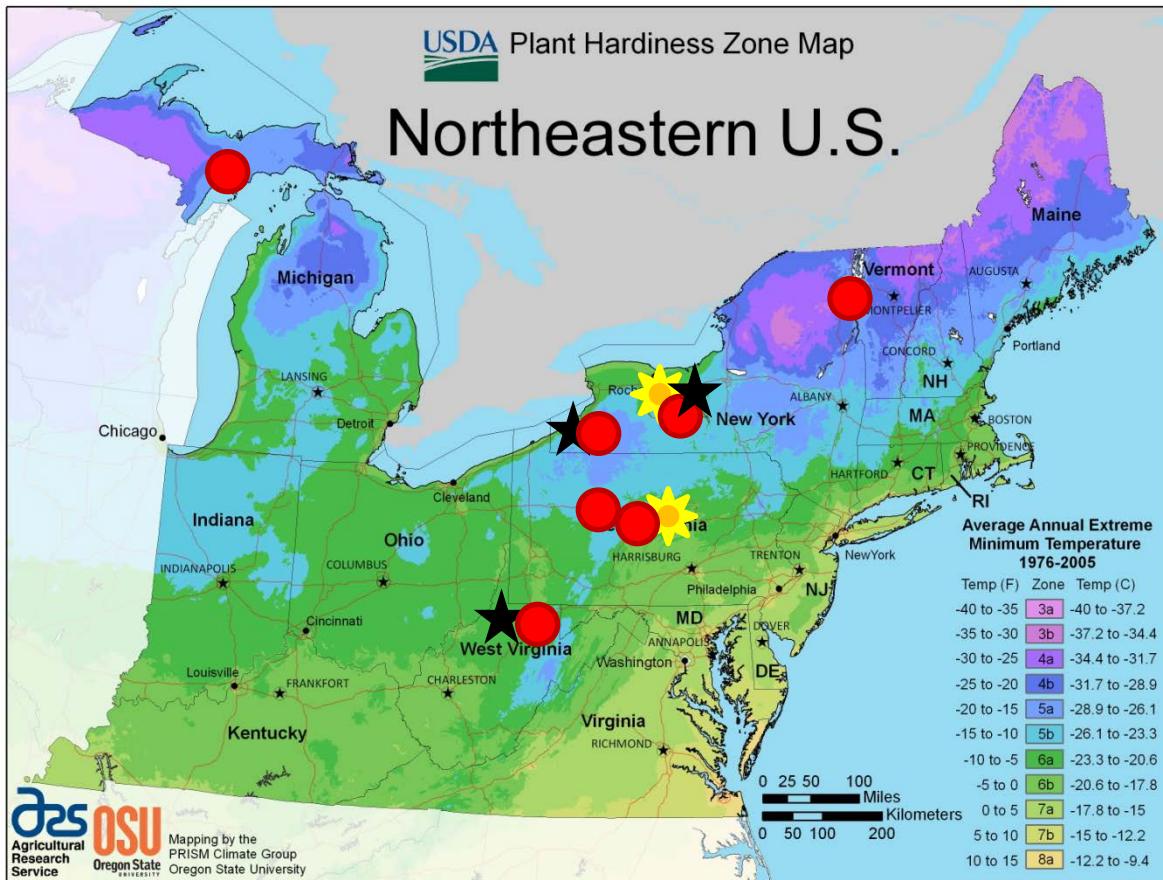
Achievements to Date:

Task 2.4 *Breeding and selection of willow and switchgrass for yield on reclaimed mine land*

- Established switchgrass and willow trials on reclaimed mine land in Philipsburg, PA
- Planted 4 acre willow demo field on reclaimed mine land in WV
- 2012 willow trial on mine land in Morgantown has very low survival



NE Sun Grant / NEWBio Regional Trials



- Yield Trials (24 cultivars, 48 plant plots)
- ★ *S. purpurea* Genetic Mapping Trials
- ☀ Polyclonal Mixture vs. Monoclonal Trials





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Future Plans:

- Genotyping-by-sequencing to map traits in willow and guide breeding & selection
- Continued evaluation of pest and disease resistance in willow and switchgrass
- Evaluate existing trials – add new trials?