Restoring underutilized Native American food crops
Navajo Spinach, Cleome serrulata & Native Peach

Spinach Introduction
- *Cleome serrulata* has been used as fresh greens and natural dye by the Navajo & Pueblo Tribes.
- Consistent supply could be of benefit as a local source of food and dye.
- This may require managed plantings.
- Germination requirements unknown.

Materials & Methods
Seed collected from 7 locations in NM, AZ, & UT

2018 Germination Treatments
- 4 weeks chilling at 4, 7, or 10°C ±
- ± Promalin® (GA₃ & BA); ± Novagib® (GA₃); ± MaxCel® (BA);
- ± Novagib® + MaxCel®; ± H₂O₂
- Seed soaked for 4 hours
- 25 seeds per rep; 5 replications
- Canyon De Chelly seed source.

Spinach Results
Soaking Trial 2017
- Treatments include GA₃ + H₂O₂, H₂O₂, and No Treatment
- GA3 increased % germination at all temperatures except 20°C
- As temperatures increase, % germination decreases
- Navajo Spinach does not germinate at 20°C
- Increasing chilling time does not improve germination
- Inconsistent T50 and T10/90 between 4 and 8 week trials

Gibberellin Trial 2017

<table>
<thead>
<tr>
<th>TREATMENTS</th>
<th>Temp (°C)</th>
<th>T50 (Days)</th>
<th>T10 (Days)</th>
<th>T90 (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA₃ 500 + PRO-H₂O₂</td>
<td>16</td>
<td>16</td>
<td>15</td>
<td>12</td>
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<tr>
<td>GA₃ 500 + PRO</td>
<td>16</td>
<td>16</td>
<td>15</td>
<td>12</td>
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<tr>
<td>GA₃ 750 + PRO-H₂O₂</td>
<td>16</td>
<td>14</td>
<td>15</td>
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<tr>
<td>GA₃ 750 + PRO</td>
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<tr>
<td>GA₃ 1000 + PRO-H₂O₂</td>
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<tr>
<td>GA₃ 1000 + PRO</td>
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<td>17</td>
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<td>H₂O₂</td>
<td>23</td>
<td>18</td>
<td>19</td>
<td>17</td>
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<tr>
<td>Control</td>
<td>20</td>
<td>13</td>
<td>18</td>
<td>21</td>
</tr>
</tbody>
</table>

- Germination improves when seed are treated with Promalin®
- % germination at 10°C was very low compared to 4°C or 7°C treatments with GA₃ used alone.
- Germination uniformity (T10-90) varied by treatment

Peach Introduction
First recorded sighting in Southwest by Spanish missionaries in 1619.
Found growing with Pueblo and Navajo Tribes
Seed propagated (Land Race)
Only 2% of original orchards remain

Fruit Characteristics
- White free-stone (most common)
- Yellow Free-stone
- Small

Genome Mapping
- DNA analysis to compare Old World peach varieties to Southwest varieties

Seed sources
- 2 Hopi, AZ
- 2 Canyon Del Muerto, AZ
- Multiple from Navajo Mountain, UT

Peach Objectives
- DNA analysis to compare Old World peach varieties to Southwest varieties

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Dendrochronology
- Compare ring widths with oral histories regarding irrigation management
- Determine life span
- Time period

Discussion
Final results for peach will be Fall 2018.


