**What IR-4 Does for Tennessee**

**IR-4 Provides Economic Viability**

The specialty food crop value in Tennessee is $460 million\(^1\)

- Specialty crops include most vegetables, fruits, nuts, herbs, nursery and flower crops.

The economic loss of these crops would be as much as $4.9 million\(^2\).

IR-4’s research helped to register Section 18 Emergency Exemptions for Tennessee, that helped prevent this loss from occurring. A registration is granted by the Environmental Protection Agency (EPA) for a particular pest control product on a specific crop. Many of these registrations have been turned to permanent registrations. In 2003, ninety-five of the 120 Section 18 Emergency Exemptions that were converted to final registrations were credited to IR-4 by the EPA.

**IR-4 Provides Research in Support of a Safe and Secure Food Supply**

The Reduced Risk chemicals that IR-4 researches and receives clearances, from the Environmental Protection Agency (EPA), are able to control pests that destroy crops, without harming the individuals that use them, the food that is harvested, or the environment in which the crops are grown.

**IR-4 Helps Farmers Compete in a Global Economy**

With farm production costs rising every day, IR-4 research helps growers stay ahead of global competition, by producing safe and effective pest management solutions for their high value specialty crops.
What IR-4 Does for Tennessee

APPLE
2,4-D
Aluminum Phosphide
Codling Moth
Granulosis Virus

BLACKBERRY
Captan
Chlorpyrifos
Esfenvalerate
Glyphosate
Norflurazon
Oxyfluorfen
Sethoxydim

BLUEBERRY
2,4-D
Captan
Chlorothalonil
Chlorpyrifos
Esfenvalerate
Ethephon
Fenhexamid
Fludioxonil
Fosetyl-Al
Glyphosate
Hexazinone
Methyl Anthranilate
Norflurazon
Terbacil
Ziram

BROCCOLI
Bacillus thuringiensis
Chlorpyrifos
Clovepralid
Glyphosate
Oxyfluorfen
Paraquat
Sodium Hypochlorite

CANTALOUPE
Bacillus thuringiensis
Dimethomorph
Glyphosate
Metalaxyl + Mancozeb
Paraquat
Permethrin

CHESTNUT
2,4-D
Carbaryl

CUCUMBER
Bacillus thuringiensis
Clomazone
Dimethomorph
Glyphosate
Paraquat
Permethrin

EDIBLEGOURDS
Bacillus thuringiensis
Mancozeb

GRAPE
Aluminum Phosphide
Chlorpyrifos
Metalaxyl + Copper
Methyl Anthranilate
Spinosad
Zinc Phosphate

HONEY and BEESWAX
Bacillus thuringiensis
Formic Acid
Menthol

LIMA BEAN
Acifluorfen
Bacillus thuringiensis
Sodium Chlorate

MUSTARD GREENS
Bacillus thuringiensis
Bensulide
Chloropyrifos
Clopyralid
Esfenvalerate
Glyphosate

OKRA
Bacillus thuringiensis
Esfenvalerate

ONION(GREEN)
Bromoxynil
Cypermethrin
Dimethomorph
Glyphosate
Methomyl
Paraquat

PEACH
2,4-D
Chlorpyrifos
Clopyralid
Dodine
Fludioxonil
Glyphosate
Iprodione
Oxytetracycline

PEPPER (BELL)
Bacillus thuringiensis
Clomazone
Glyphosate
Imidacloprid
S-Metolachlor
Paraquat
Permethrin

Clearances On Some Important Tennessee Crops

continued on back
## Clearances On Some Important Tennessee Crops

<table>
<thead>
<tr>
<th>Crop</th>
<th>Clearances</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PEPPER (NON-BELL)</strong></td>
<td>Bacillus thuringiensis&lt;br&gt;Clomazone&lt;br&gt;Glyphosate&lt;br&gt;Imidacloprid</td>
</tr>
<tr>
<td><strong>RASPBERRY</strong></td>
<td>2,4-D&lt;br&gt;Captan&lt;br&gt;Chlorpyrifos&lt;br&gt;Endosulfan&lt;br&gt;Glyphosate&lt;br&gt;Hexakis&lt;br&gt;Norflurazon&lt;br&gt;Oxyfluorfen&lt;br&gt;Sethoxydim&lt;br&gt;Sulfur</td>
</tr>
<tr>
<td><strong>SNAP BEAN</strong></td>
<td>Clomazone&lt;br&gt;Halosulfuron&lt;br&gt;Lactofen</td>
</tr>
<tr>
<td><strong>SOUTHERN PEAS</strong></td>
<td>Acifluorfen&lt;br&gt;Bacillus thuringiensis&lt;br&gt;Chlordathionil&lt;br&gt;Cyfluthrin&lt;br&gt;Cyromazine&lt;br&gt;Sodium Chlorate</td>
</tr>
<tr>
<td><strong>SPINACH</strong></td>
<td>Bacillus thuringiensis&lt;br&gt;Clopyralid&lt;br&gt;Glyphosate&lt;br&gt;S-Metolachlor&lt;br&gt;Phenmedipham&lt;br&gt;Sethoxydim</td>
</tr>
<tr>
<td><strong>SQUASH</strong></td>
<td>(WINTER/SUMMER)&lt;br&gt;Bacillus thuringiensis&lt;br&gt;Clomazone&lt;br&gt;Dimethomorph&lt;br&gt;Glyphosate&lt;br&gt;Imidacloprid&lt;br&gt;Metalaxyl + Mancozeb&lt;br&gt;Pramocid&lt;br&gt;Paraquat</td>
</tr>
<tr>
<td><strong>STRAWBERRY</strong></td>
<td>2,4-D&lt;br&gt;Acifluorfen&lt;br&gt;Captan&lt;br&gt;Chlorpyrifos&lt;br&gt;Methyl Anthranilate&lt;br&gt;SUGAR PEAS&lt;br&gt;Bacillus thuringiensis</td>
</tr>
<tr>
<td><strong>SWEET CORN</strong></td>
<td>2,4-D&lt;br&gt;Bacillus thuringiensis&lt;br&gt;Propargite</td>
</tr>
<tr>
<td><strong>SWEET POTATO</strong></td>
<td>Bacillus thuringiensis&lt;br&gt;Calcium Hypochlorite&lt;br&gt;Carbaryl&lt;br&gt;Clomazone&lt;br&gt;Fluazifop&lt;br&gt;Napropamide&lt;br&gt;Phosmet&lt;br&gt;Pyrethrin + Piperonyl&lt;br&gt;Butoxide&lt;br&gt;Sethoxydim&lt;br&gt;Thiabendazole</td>
</tr>
<tr>
<td><strong>TOMATO</strong></td>
<td>Bacillus thuringiensis&lt;br&gt; Glyphosate&lt;br&gt;Imidacloprid&lt;br&gt;Paraquat</td>
</tr>
<tr>
<td><strong>TOMATO</strong></td>
<td>Bacillus thuringiensis&lt;br&gt; Glyphosate&lt;br&gt;Imidacloprid&lt;br&gt;Paraquat</td>
</tr>
<tr>
<td><strong>TURNIP (ROOT /TOP)</strong></td>
<td>Bacillus thuringiensis&lt;br&gt;Chlorpyrifos&lt;br&gt;Clopyralid&lt;br&gt;Esfenvalerate&lt;br&gt;Fosetyl-AL&lt;br&gt;Methomyl</td>
</tr>
<tr>
<td><strong>WATERCRESS</strong></td>
<td>Azoxystrobin (Sec. 18)&lt;br&gt;Bacillus thuringiensis&lt;br&gt;Fludioxonil&lt;br&gt;Gibberellic Acid&lt;br&gt;Glyphosate</td>
</tr>
</tbody>
</table>
| **WATERMELON**      | Bacillus thuringiensis<br>Bifenthrin<br>Glyphosate<br>Imidacloprid<br>Metalaxyl + Mancozeb<br>Pramocid<br>Paraquat<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid<br>Pramocid

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IR-4: A Success Story Worth Telling

Since 1963, the IR-4 Project has cooperated with researchers, producers, the agri-chemical industry and federal agencies to secure regulatory clearances for pest management products on specialty crops.

Since 2000, over 80% of IR-4’s research effort has involved new pest management technology with biopesticides and Reduced Risk chemistries. This huge shift was a direct result of the focus IR-4 placed on advocating this new technology. It was accomplished through a three pronged approach consisting of partnering with the agricultural chemical companies, educating specialty crop stakeholders, and partnering with the EPA to facilitate specialty crop registrations.

IR-4 recognized that without access to the new technology it could not assist specialty crop growers. So they solicited industry’s willingness to work together on new product development strategies which, for the first time, included specialty crops in their development plans. The foundation for this close working relationship was crop grouping, where studies on a few key crops would allow for registration on many more crops; many of those were specialty crops.

The other aspect of IR-4’s emphasis on new technology was the educational facet. It became clear that with reduced staffs in many of the companies due to mergers, federal and state research/extension scientists were not always given the ability to test the new materials. IR-4 instituted a mechanism through publication of New Pest Control Products/Transition Solutions List to inform the public about the virtues of the new technology to assist in the transition away from Food Quality Protection Act (FQPA) vulnerable crop protection tools.

Today, IR-4 continues to work as a model government funded program due to unique partnerships formed between the USDA (CSREES and ARS), the IR-4 Headquarters and Regional staff, the land grant university system, the crop protection industry, commodity and grower groups and the EPA.

Tennessee Agriculture is Heavily Dependent on Specialty Crops
IR-4 thanks the entire Congressional delegation from Tennessee for their support.

Estimated Potential Loss Without Use of the IR-4 Based Section 18s for Tennessee
(from 1998-2002)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Economic Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cowpea/Lima Bean</td>
<td>$ 2,400,000</td>
</tr>
<tr>
<td>Strawberry</td>
<td>$ 2,100,000</td>
</tr>
<tr>
<td>Watercress</td>
<td>$ 400,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$ 4,900,000</strong></td>
</tr>
</tbody>
</table>

1997 Census of Agriculture  
2 From 1998 to 2002