Herbicide Use: Benefits and Trends in California Crops

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CropLife Foundation Project

- 31 Crops
- 60 Herbicide Active Ingredients
- DPR Data 1992-2011
- Acre Treatments
- California Statewide
California Herbicide Use

31 Crops

Year


Acres

Acre Treatments
Herbicides & Walnuts

Year: 1992 to 2011

- **TOTAL ACRE TREATMENT**
- **ACRES**
Herbicides & Almonds

Year
- 1992
- 1993
- 1994
- 1995
- 1996
- 1997
- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011

TOTAL ACRE TREATMENTS

ACRES
Herbicide Use: Tree and Vine Crops

- Early 1990’s:
  - Preemergence Herbicides
  - Residual Control: 8-12 Months
  - Preemergence Herbicides Classified as GW Contaminants
    - Use Permit Required
    - Use Declined
  - Growers Substituted
    - Preemergence herbicides with shorter residual
    - Postemergence herbicides with no residual
    - More treatments per acre
Orchard Weed Control Programs

<table>
<thead>
<tr>
<th>Program</th>
<th># of Applications</th>
<th># of Acre Treatments</th>
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</thead>
<tbody>
<tr>
<td>Pre-Emergence (1990s)</td>
<td></td>
<td></td>
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<tr>
<td>Postemergence (2000s)</td>
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<tr>
<td>Postemergence (2010s)</td>
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</tbody>
</table>
Norflurazon

![Graph showing the trend of Norflurazon from 1992 to 2011.]
Simazine

The graph shows the trend of Simazine over the years from 1992 to 2010. The numbers on the y-axis represent units, and the years are marked on the x-axis. The line indicates a general decrease in Simazine over the years.
Glyphosate
<table>
<thead>
<tr>
<th>Year</th>
<th>Cost ($/pint)</th>
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<tbody>
<tr>
<td>1995</td>
<td>6.86</td>
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<tr>
<td>2012</td>
<td>2.06</td>
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</table>
### Glyphosate Effectiveness

<table>
<thead>
<tr>
<th>Control Level</th>
<th># of weed Species</th>
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<tbody>
<tr>
<td>Controls</td>
<td>52</td>
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<tr>
<td>Partial Control</td>
<td>5</td>
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<tr>
<td>No Control</td>
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<tr>
<td>Resistant Populations</td>
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</tbody>
</table>

Total: 64
Glyphosate Resistant Marestail
Vineyard: Herbicide Spray Strip
## California Crops Herbicide Use (2011)

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Acres (Millions)</th>
<th>Treatment Per Acre</th>
<th>Total Acre Treatments (Millions)</th>
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</thead>
<tbody>
<tr>
<td>Tree &amp; Vine Crops:</td>
<td>2.4</td>
<td>3.6</td>
<td>8.7</td>
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<tr>
<td>Field Crops:</td>
<td>1.9</td>
<td>2.7</td>
<td>5.3</td>
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<tr>
<td>Vegetable Crops:</td>
<td>.8</td>
<td>1.7</td>
<td>1.4</td>
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## California Herbicide Acre Treatments: Carrot

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<thead>
<tr>
<th>Year</th>
<th>ACRES</th>
<th>LINURON</th>
<th>PENDIMETHALIN</th>
<th>TRIFLURALIN</th>
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<tr>
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<td>2010</td>
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<tr>
<td>2011</td>
<td>0</td>
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</table>
Linuron: Carrots

- Main herbicide since 1966
- Controls all important weeds in carrot fields
- No resistance in weed populations
- No injury to carrots
- Can be used preemergence and postemergence
- Delivers Net profits of $980 to $6426/hectare

Bell, et al, 2000
Herbicide Experiment: Carrots

Treated

Untreated
Leaf Lettuce, Herbicides

Acre Treatments

Year


BENEFIN
BENSULIDE
CLETHODIM
GLYPHOSATE
PARAQUAT
PRONAMIDE
SETHOXYDIM
Lettuce Thinning and Handweeding

(hours/acre)

Pronamide: 30
Bensulide: 55
No Herbicide: 70

Fennimore, 1999
Onion Weed Control
Timing and Materials

Preplant
- Metam
- Paraquat
- Roundup
- Shark
- Scythe

Post plant
- Dacthal
- Prefar
- Preemergence to weeds

Postemergence
- 2nd true leaf
- Goal
- Buctril
- Prowl
- Select Max
- Poast
- Fusilade
Onion Weed Control Trial

Un-treated

Outlook 14.0 oz 1st true leaf after 7-7-07
California Strawberries

Acre Treatments

Year


METHYL BROMIDE

ACRES
Strawberry Acres & Herbicide Use

Year


ACRES

FLUMIOXAZIN
NAPROPAMIDE
OXYFLUORFEN
PENDIMETHALIN
CARFENTRAZONE

0 5000 10000 15000 20000 25000 30000 35000 40000 45000
California Herbicide Acre Treatments Indices: Strawberry
California Herbicide Use: Key Impact Factors

• Resistance
• Regulation
• Registration
• Research
Other Impact Factors

- Weather
- Commodity Prices
- Fumigants
- Cost of Fuel and Labor
- Increase in Conservation Tillage
- “Sustainability” Initiatives
- Biotech Herbicide Tolerant Crops
- Non Chemical Alternatives
- Organic
Bromoxynil
Q: Has herbicide use increased or decreased in California Crops?

A:
Q: Has herbicide use increased or decreased in California Crops?
A: Yes
Visit Us At: www.CropLifeFoundation.org
California Production: Asparagus

Year


Million LBS/YR