

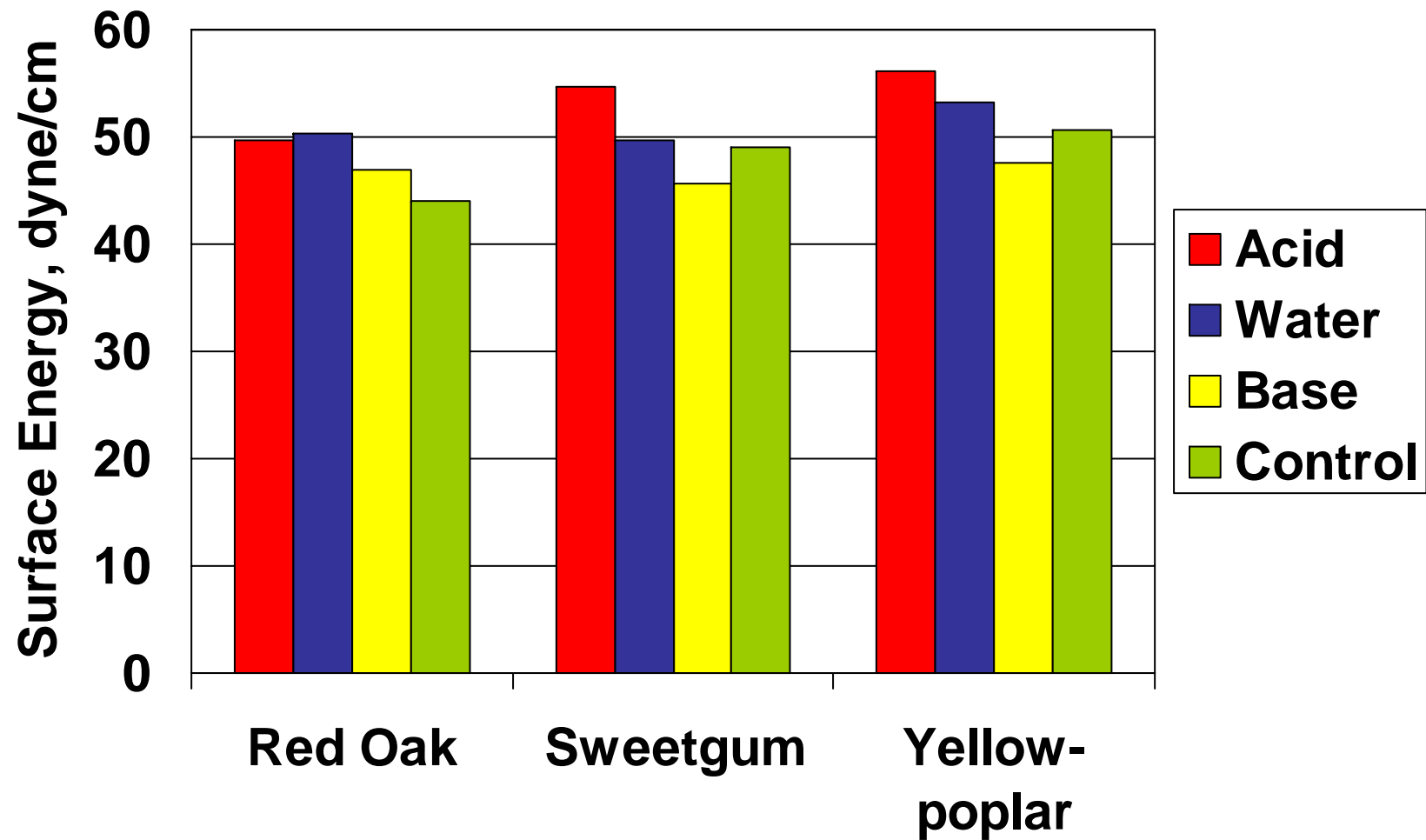
# INFLUENCES ON THE WETTABILITY OF HYDROTHERMALLY TREATED SOUTHERN HARDWOOD SPECIES

By

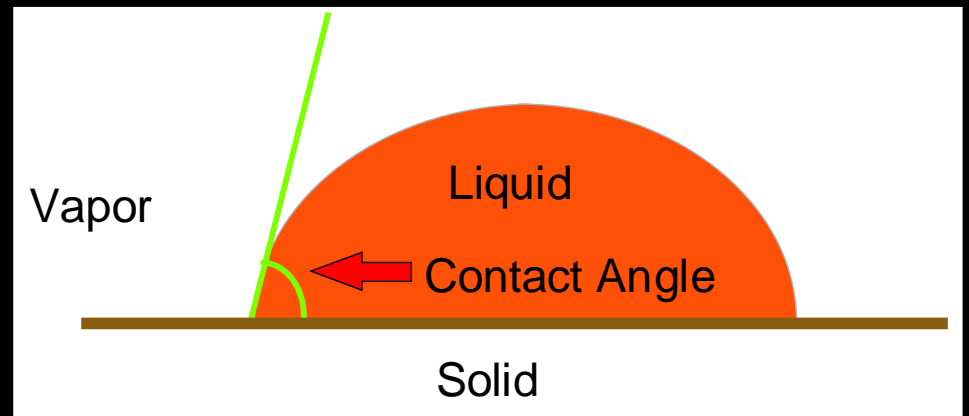
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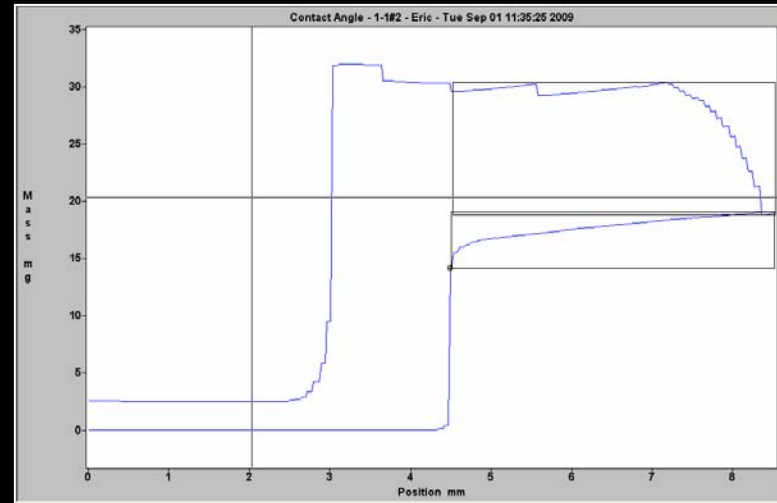
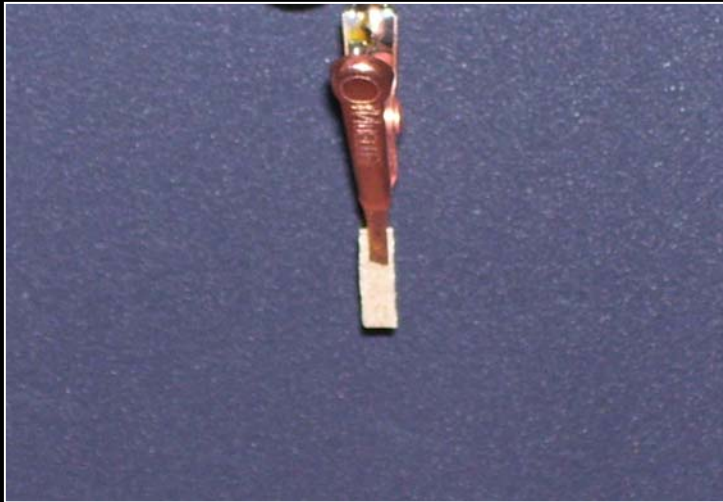
# Surface Energies



- First, determine the time and temperature effect on the DCA of Red Oak, Sweetgum, and Yellow-poplar in pMDI resin at 20°C
  - 2 times: 30 and 60 minutes
  - 2 temperatures: 145 and 175°C
- Second, determine temperature effect of pMDI on the optimum extraction parameters
  - 3 temperatures: 20, 50, and 80°C







## Contact Angle

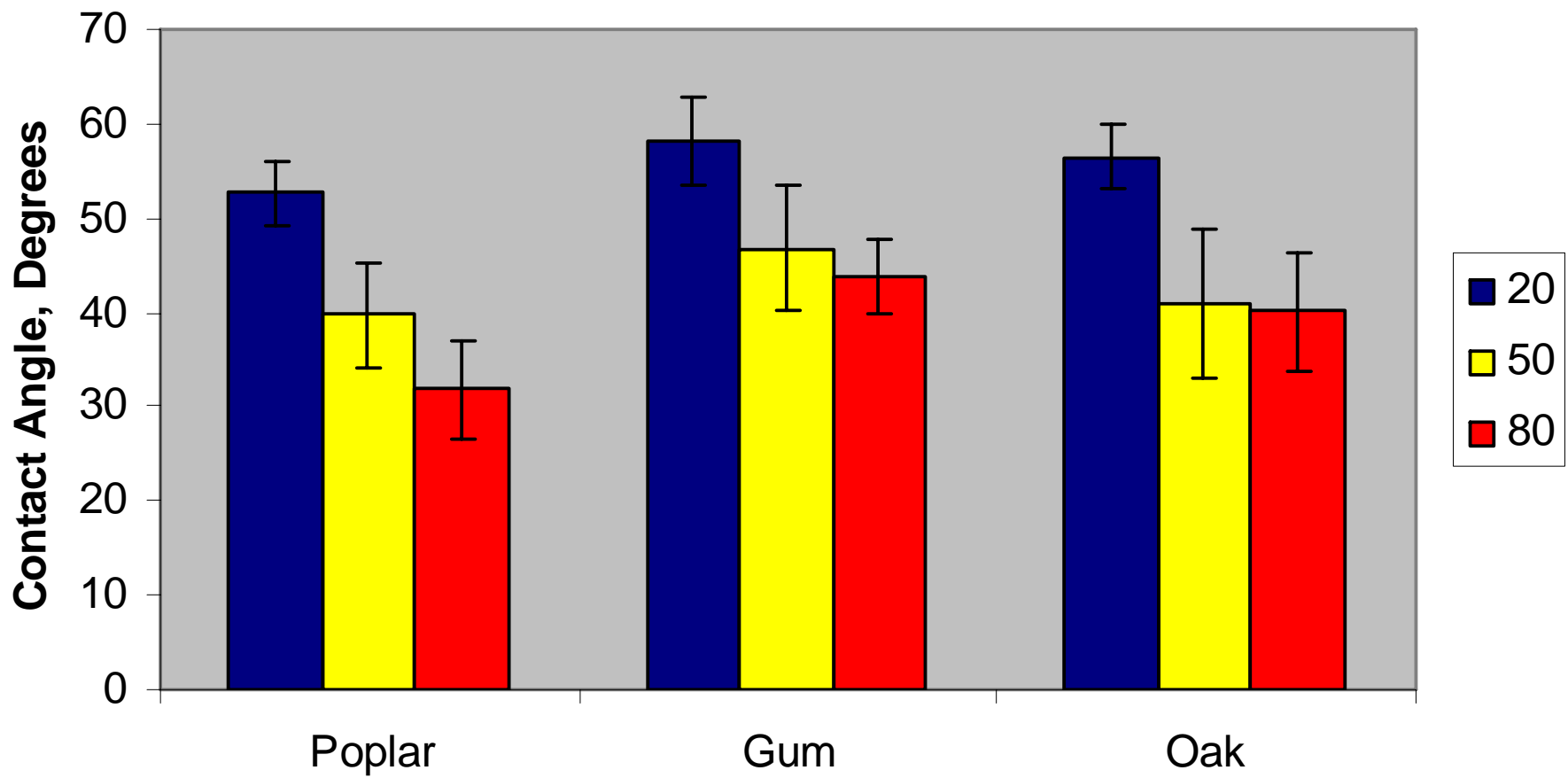
Species	Time	Temperature	Mean, Degrees	CV, %
Yellow-poplar	30	145	63.8	5.2
		175	<b>52.2</b>	5.3
	60	145	62.5	4.3
		175	63.8	6.4
Sweetgum	30	145	51.8	6.0
		175	54.4	7.0
	60	145	54.3	3.7
		175	52.3	14.3
Red Oak	30	145	64.7	5.2
		175	<b>54.6</b>	4.0
	60	145	65.7	2.7
		175	<b>53.8</b>	7.1

<b>t Group</b>	<b>Mean, Degrees</b>	<b>Treatment Combination</b>
A	66.7	Oak-30-145
A	65.7	Oak-60-145
A	63.8	Poplar-60-175
A	63.8	Poplar-30-145
A	62.5	Poplar-60-145
<b>B</b>	<b>54.6</b>	<b>Oak-30-175</b>
<b>B</b>	<b>54.4</b>	<b>Gum-30-175</b>
B	54.3	Gum-60-145
B	53.8	Oak-60-175
B	53.8	Oak-60-175
B	52.3	Gum-60-175
<b>B</b>	<b>52.2</b>	<b>Poplar-30-175</b>
B	51.8	Gum-30-145

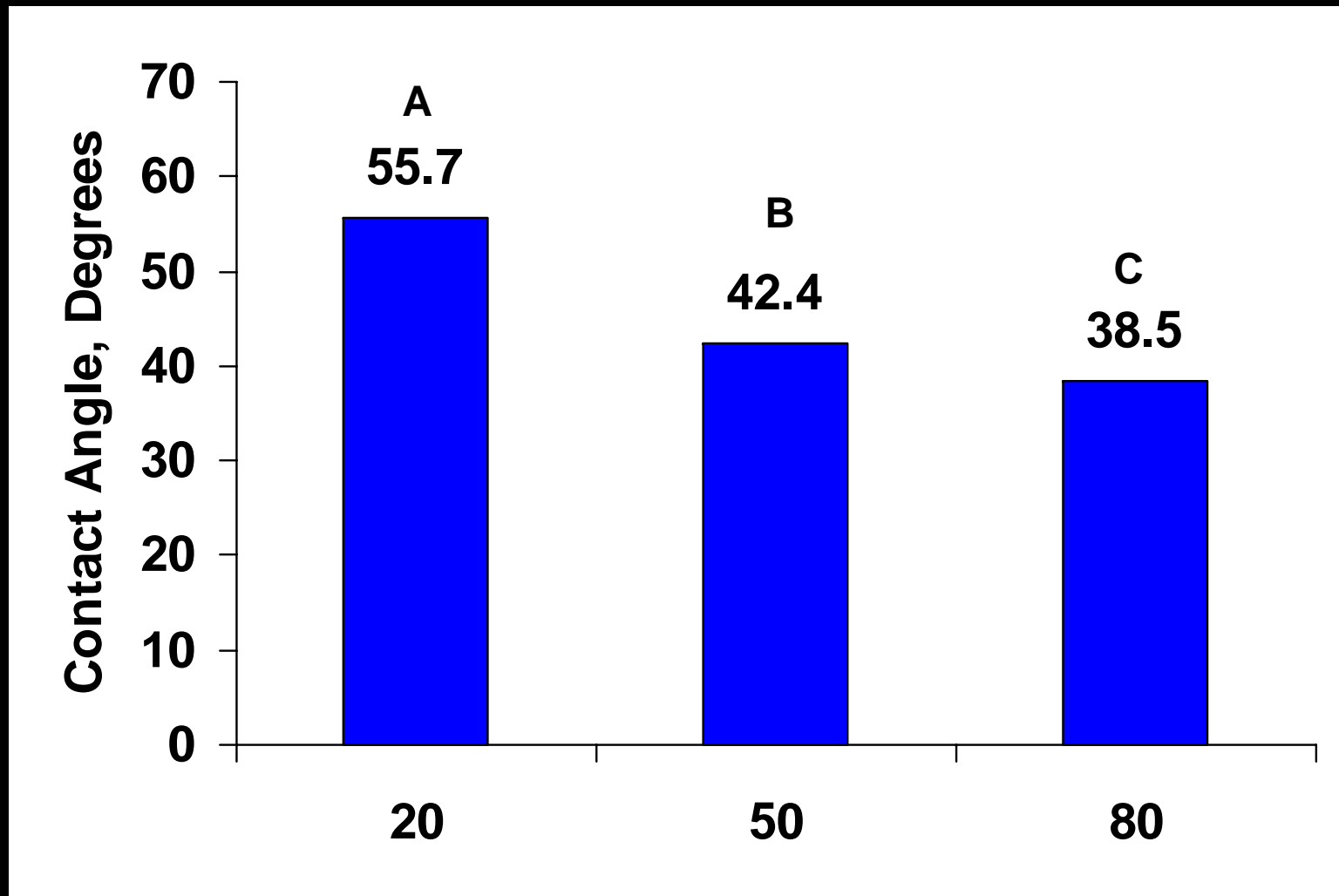
# Test 2

- Used each species at the 30 minutes / 175°C combination
- Probe Liquid - pMDI
  - 3 temperatures – 20, 50, 80°C

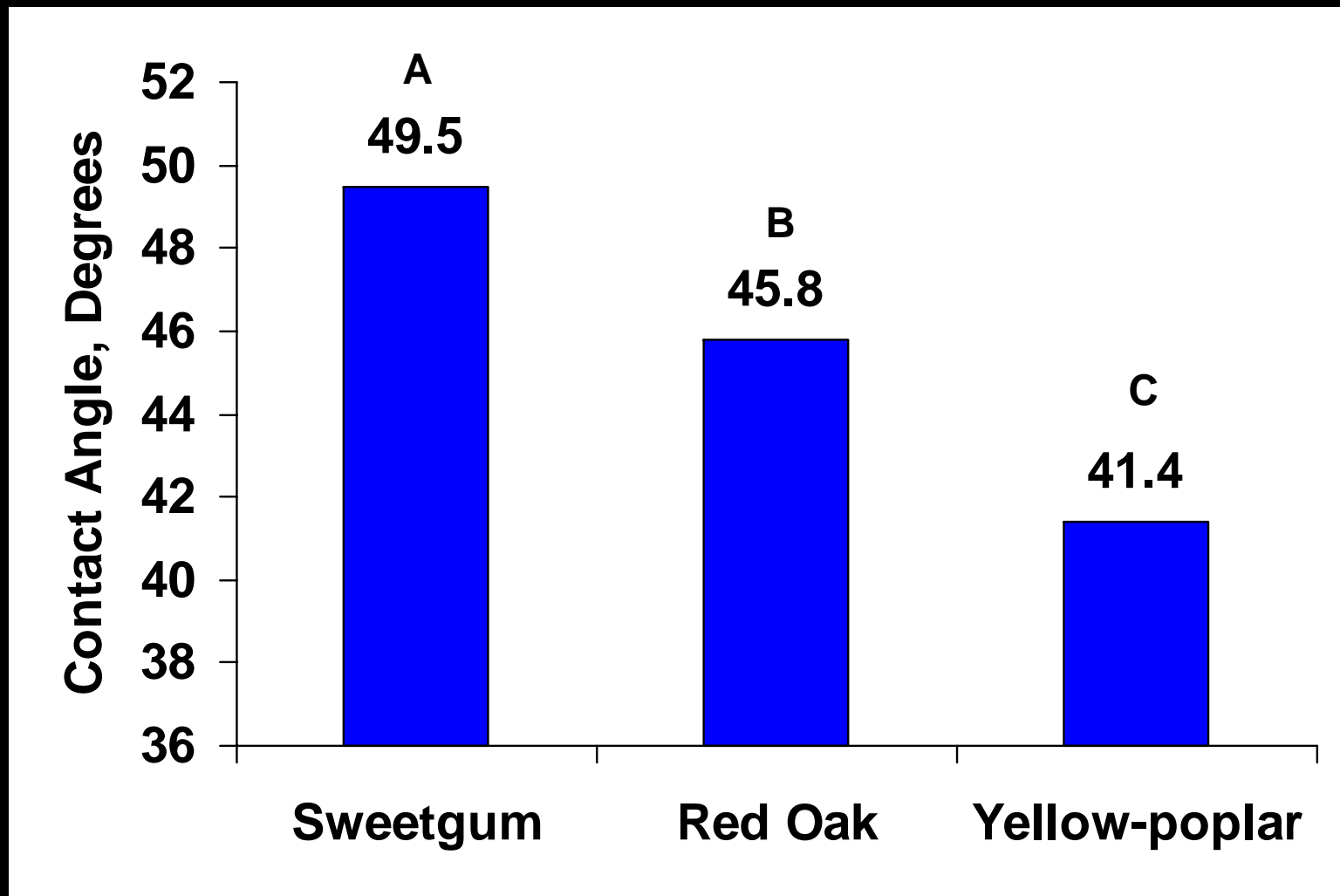




# pMDI Temperature Effect



# Species Effect



# Conclusions: Treatment Time and Temperature Effect

- Yellow-poplar: 30-175 significantly lower than other combinations
- Sweetgum: no overall effect
- Red Oak: Significant temperature effect





# Conclusions: pMDI Temperature Effect

- Adhesive temperature effect is generally nonlinear across species
- Greater overall effect on Poplar and Oak vs. Gum



# Thank You

For further information

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