
Payload Operations Integration Center
NASA Marshall Space Flight Center
Huntsville, Alabama
SAFETY

1
00:00:01,600 --> 00:00:03,069
>> We're going to go next to
Marshall Space Flight Center

2
00:00:03,069 --> 00:00:04,603
in Huntsville, Alabama.

3
00:00:04,603 --> 00:00:07,106
Where Lori Megs is
standing by live to tell us

4
00:00:07,106 --> 00:00:11,010
about a veggies experiment
in space.

5
00:00:11,010 --> 00:00:12,511
Lori?

6
00:00:12,511 --> 00:00:14,847
>> Well it's vital for
astronauts to learn how

7
00:00:14,847 --> 00:00:17,216
and be able to grow
their own vegetables

8
00:00:17,216 --> 00:00:19,351
as we further explore
the solar system.

9
00:00:19,351 --> 00:00:22,555
But what would it take to
grow a garden in space?

10
00:00:22,555 --> 00:00:24,256
Sounds easy, but is it?

11
00:00:24,256 --> 00:00:26,392
Joining me now is Paul

Zamprelli, and Paul,

12
00:00:26,392 --> 00:00:28,194
I'm told that you might
know the answer to this.

13
00:00:28,194 --> 00:00:32,364
You've got a new experiment up
and it's -- I like the name.

14
00:00:32,364 --> 00:00:33,065
It's easy.

15
00:00:33,065 --> 00:00:34,333
VEGGIE. I can relate.

16
00:00:34,333 --> 00:00:35,701
Tell us about VEGGIE.

17
00:00:35,701 --> 00:00:39,972
>> Well VEGGIE's -- it's a been
a 10 year development based

18
00:00:39,972 --> 00:00:44,043
on an SBIR -- or Small
Business Innovative Research --

19
00:00:44,043 --> 00:00:45,377
with NASA.

20
00:00:45,377 --> 00:00:47,613
Working out of Kennedy.

21
00:00:47,613 --> 00:00:51,784
It's a plant production system
basically, that's going up.

22
00:00:51,784 --> 00:00:53,853
Very interactive

with the astronauts.

23
00:00:53,853 --> 00:01:02,862
To be able to grow food,
lettuce and a whole dietary plan

24
00:01:03,796 --> 00:01:05,731
for the astronauts
for nutrition.

25
00:01:05,731 --> 00:01:07,066
>> So how does it work?

26
00:01:07,066 --> 00:01:12,338
>> So basically the unit is
a box that has LED lighting.

27
00:01:12,338 --> 00:01:16,509
And it actually -- you
can see it there --

28
00:01:16,509 --> 00:01:19,712
it has LED lighting that
is an accordion type

29
00:01:19,712 --> 00:01:24,750
and the plants grow as -- and
it is very interactive with,

30
00:01:24,750 --> 00:01:28,187
and the astronauts can
touch and feel and tend

31
00:01:28,187 --> 00:01:30,156
to it just like a real garden.

32
00:01:30,156 --> 00:01:32,324
So we're growing lettuce?

33

00:01:32,324 --> 00:01:33,659
>> We are.

34
00:01:33,659 --> 00:01:38,898
The first mission, as it goes
up, which is slated to be

35
00:01:38,898 --> 00:01:43,869
on Space X3, will grow
lettuce and take a look

36
00:01:43,869 --> 00:01:45,871
at the growth pattern.

37
00:01:45,871 --> 00:01:47,907
And then it will be
harvested and brought back

38
00:01:47,907 --> 00:01:53,612
down for research on the lettuce
itself, looking for microbials

39
00:01:53,612 --> 00:01:57,449
or any kind of impurities

40
00:01:57,449 --> 00:01:59,451
that may hurt the
astronauts if they eat it.

41
00:01:59,451 --> 00:02:01,187
>> And this is really
the first of its kind,

42
00:02:01,187 --> 00:02:03,622
because this is going to
have crew interaction,

43
00:02:03,622 --> 00:02:06,926
and it's also going to
grow off the cabin air.

44
00:02:06,926 --> 00:02:07,760
>> Correct.

45
00:02:07,760 --> 00:02:08,994
Correct. Most of the science --

46
00:02:08,994 --> 00:02:12,431
there's been a lot of plant
science put on station.

47
00:02:12,431 --> 00:02:15,601
But it's all been encased,
and very hands-off.

48
00:02:15,601 --> 00:02:18,204
The environment has been
very strict with it.

49
00:02:18,204 --> 00:02:23,609
This is open to the
air, being able to grow

50
00:02:23,609 --> 00:02:26,478
on the air that's
in the cabin itself.

51
00:02:26,478 --> 00:02:27,713
So it's different.

52
00:02:27,713 --> 00:02:29,448
>> Now it looks red, but
it's not right [chuckles]?

53
00:02:29,448 --> 00:02:33,586
>> No that -- actually it's
-- the LED lights, we --

54
00:02:33,586 --> 00:02:35,921

what we do for low
power consumption,

55
00:02:35,921 --> 00:02:39,892
we take just the light
a plant needs to grow,

56
00:02:39,892 --> 00:02:43,862
that light is a lot of
red and some other blends.

57
00:02:43,862 --> 00:02:47,433
It matters what type of plant
we have in it, but Dr. Morrow,

58
00:02:47,433 --> 00:02:53,872
back at Orbitech has been very
instrumental in being able

59
00:02:53,872 --> 00:02:55,674
to do the right pitches
for the plants.

60
00:02:55,674 --> 00:02:57,376
There's a lot of science
that goes into it,

61
00:02:57,376 --> 00:02:59,712
but it makes it grow
very fast and efficient.

62
00:02:59,712 --> 00:03:02,147
>> So what is the
science mission here?

63
00:03:02,147 --> 00:03:03,048
We're going to grow it.

64
00:03:03,048 --> 00:03:03,882
Harvest it.

65
00:03:03,882 --> 00:03:04,817
Then they won't eat it right?

66
00:03:04,817 --> 00:03:06,218
>> Correct.

67
00:03:06,218 --> 00:03:09,488
Correct. No, it has to be flown
back down, and then analyzed.

68
00:03:09,488 --> 00:03:14,627
And then once that is approved,
then they can start growing

69
00:03:14,627 --> 00:03:16,128
and eating it as a supplement

70
00:03:16,128 --> 00:03:17,396
for what they're
doing on station.

71
00:03:17,396 --> 00:03:19,265
>> And you have a
unit here, right?

72
00:03:19,265 --> 00:03:20,499
>> I do.

73
00:03:20,499 --> 00:03:23,869
>> This actually is what
we call pillow -- a pillow.

74
00:03:23,869 --> 00:03:28,841
And it has a spigot to
inject the water into it.

75
00:03:28,841 --> 00:03:30,609
It's a manual injection.

76
00:03:30,609 --> 00:03:34,647
And this goes inside
of the plant unit.

77
00:03:34,647 --> 00:03:37,916
And then the plant just
starts growing out of here,

78
00:03:37,916 --> 00:03:39,885
and it follows the
track of the light just

79
00:03:39,885 --> 00:03:41,553
like normal plants do.

80
00:03:41,553 --> 00:03:44,823
It -- the challenges
we have with 0 G is

81
00:03:44,823 --> 00:03:46,125
to keep everything encased.

82
00:03:46,125 --> 00:03:49,828
All the soil, the
nutrients, the seeds.

83
00:03:49,828 --> 00:03:51,530
We can't have everything
flowing around,

84
00:03:51,530 --> 00:03:53,165
because it is open to the cabin.

85
00:03:53,165 --> 00:03:57,369
And we don't want any of the
impurities or any of the --

86
00:03:57,369 --> 00:03:59,171

call it dirt -- to get out.

87
00:03:59,171 --> 00:04:01,106
And it grows very cleanly.

88
00:04:01,106 --> 00:04:02,241
And this material --

89
00:04:02,241 --> 00:04:05,544
it's a Kevlar material
-- and we're very happy.

90
00:04:05,544 --> 00:04:07,446
And this was co-produced
or co-developed

91
00:04:07,446 --> 00:04:09,882
with NASA and Orbitech.

92
00:04:09,882 --> 00:04:13,319
>> And growing a garden is just
not good for the return there,

93
00:04:13,319 --> 00:04:15,821
but it's also good for
mental health right?

94
00:04:15,821 --> 00:04:16,755
>> Absolutely.

95
00:04:16,755 --> 00:04:18,157
There's been a lot
of science done,

96
00:04:18,157 --> 00:04:22,594
and we work with the University
of Wisconsin in this as well.

97
00:04:22,594 --> 00:04:27,399

And the environment of a plant
or plants have been shown

98
00:04:27,399 --> 00:04:31,570
to create a stimulus
inside of the human being

99
00:04:31,570 --> 00:04:33,372
that is all goodness
and wholesome.

100
00:04:33,372 --> 00:04:36,875
And especially on
long duration space,

101
00:04:36,875 --> 00:04:41,046
and some of the terrestrial
applications too

102
00:04:41,046 --> 00:04:42,114
for here on Earth.

103
00:04:42,114 --> 00:04:45,184
It's very good for the brain.

104
00:04:45,184 --> 00:04:47,653
>> And why did you want
to grow plants in space?

105
00:04:47,653 --> 00:04:50,456
What brought the interest
about to your company

106
00:04:50,456 --> 00:04:53,392
and how did you get
involved with NASA?

107
00:04:53,392 --> 00:04:56,261
>> Well -- our owners, Dr.
Crice [phonetic] and Ron Teeter

108
00:04:56,261 --> 00:04:58,731
and Tom Kreb [phonetic],
they have a vision.

109
00:04:58,731 --> 00:05:02,501
And their vision is for
humankind out in space --

110
00:05:02,501 --> 00:05:06,839
not only habitating the moon and
Mars, but long duration space.

111
00:05:06,839 --> 00:05:08,807
And plants play a
big part in that.

112
00:05:08,807 --> 00:05:12,711
And of course, with Wisconsin,
and that influence on growing

113
00:05:12,711 --> 00:05:15,381
and farming, and everything like
that, it was just a natural,

114
00:05:15,381 --> 00:05:17,716
in this area, to
be able to do that.

115
00:05:17,716 --> 00:05:19,785
So we're very excited.

116
00:05:19,785 --> 00:05:21,754
Our engineers, Robert
Richter [phonetic].

117
00:05:21,754 --> 00:05:26,859
Ross -- well I don't want to
forget names here, because --

118
00:05:26,859 --> 00:05:31,196
Ross Ramicher [phonetic],
Jim Harris, and Dr. Morrow,

119
00:05:31,196 --> 00:05:32,598
have worked very hard.

120
00:05:32,598 --> 00:05:37,269
And the owners have given their
careers to a lot of this science

121
00:05:37,269 --> 00:05:40,072
that is now going
up on station again.

122
00:05:40,072 --> 00:05:42,341
And we're very happy about that.

123
00:05:42,341 --> 00:05:45,344
>> When will we see
this on station?

124
00:05:45,344 --> 00:05:50,949
>> So it's slated to fly
February on Space X3.

125
00:05:50,949 --> 00:05:54,319
So we're very anticipating that,

126
00:05:54,319 --> 00:05:55,988
and want to get this
up and going.

127
00:05:55,988 --> 00:05:58,490
We're going to first
grow lettuce.

128
00:05:58,490 --> 00:06:02,194
But when that comes down

we've also got loaded pillows

129
00:06:02,194 --> 00:06:03,095
to grow flowers.

130
00:06:03,095 --> 00:06:03,962
>> Oh, how nice [chuckles].

131
00:06:03,962 --> 00:06:05,297
>> While they're
waiting on that.

132
00:06:05,297 --> 00:06:07,466
So, you know, it's just we're
going to keep it going --

133
00:06:07,466 --> 00:06:09,001
>> Going to spiffy up
the place up there right?

134
00:06:09,001 --> 00:06:10,235
[Chuckles].

135
00:06:10,235 --> 00:06:11,170
>> Absolutely [chuckles]
it's -- and they're zinnias.

136
00:06:11,170 --> 00:06:11,703
That's what --

137
00:06:11,703 --> 00:06:12,905
>> Oh okay.

138
00:06:12,905 --> 00:06:14,706
>> I wrote it down to make
sure I remembered that.

139
00:06:14,706 --> 00:06:17,209
>> [Chuckles] and tell us

about the Earth applications.

140
00:06:17,209 --> 00:06:19,344
I know there's a
lot to that as well.

141
00:06:19,344 --> 00:06:21,713
And kids can get
involved too, right?

142
00:06:21,713 --> 00:06:22,781
Or they have before.

143
00:06:22,781 --> 00:06:23,615
>> Right. Yeah.

144
00:06:23,615 --> 00:06:26,051
That's a very good stem program.

145
00:06:26,051 --> 00:06:29,154
We've actually made
some space gardens here

146
00:06:29,154 --> 00:06:30,856
that we have put
into the schools.

147
00:06:30,856 --> 00:06:34,560
The Astro garden that is
like this unit has been

148
00:06:34,560 --> 00:06:37,196
on station many times, growing.

149
00:06:37,196 --> 00:06:40,933
And we'd love to interact
with the universities;

150
00:06:40,933 --> 00:06:44,403

elementary' S. They can actually
grow what the astronauts are

151
00:06:44,403 --> 00:06:47,506
growing up on space, so
-- or on space station.

152
00:06:47,506 --> 00:06:49,842
And, you know, one of
the things I wanted

153
00:06:49,842 --> 00:06:52,945
to do was thank some
people on this with --

154
00:06:52,945 --> 00:06:55,380
and I need to mention
the NASA folks.

155
00:06:55,380 --> 00:06:57,850
Our cooperation with NASA
has just been wonderful.

156
00:06:57,850 --> 00:07:00,886
And with -- especially with
Kennedy, on not only this,

157
00:07:00,886 --> 00:07:04,423
but advanced plan habitats
and things like that.

158
00:07:04,423 --> 00:07:07,726
Just to mention a few, and I
know I'll make some people mad,

159
00:07:07,726 --> 00:07:09,928
but Brian Onaudie [phonetic].

160
00:07:09,928 --> 00:07:13,799
Joy Amasa -- Joy Amasa

[phonetic] is the lead scientist

161
00:07:13,799 --> 00:07:16,735
for the science that's
going up out of Kennedy.

162
00:07:16,735 --> 00:07:20,305
Nicole Duffer [phonetic], Torri
Long [phonetic], Luke Robertson

163
00:07:20,305 --> 00:07:22,007
and Monica Solar [phonetic].

164
00:07:22,007 --> 00:07:25,277
The other is the support
we've had from NASA.

165
00:07:25,277 --> 00:07:27,613
Washington from the NASA brass

166
00:07:27,613 --> 00:07:29,915
with this project
has been great.

167
00:07:29,915 --> 00:07:32,784
And Charlie Qunicy and
Mary Beth Adine [phonetic].

168
00:07:32,784 --> 00:07:34,319
And of course Julie Robinson

169
00:07:34,319 --> 00:07:38,857
from the Johnson Group have
just been outstanding for this.

170
00:07:38,857 --> 00:07:42,928
The SBIR Program Works, we're
able to do a lot of things

171

00:07:42,928 --> 00:07:45,230
with the SBIR Program.

172
00:07:45,230 --> 00:07:48,267
We've enjoyed a bunch, which
we then commercialized --

173
00:07:48,267 --> 00:07:50,202
which we're commercializing
this as well.

174
00:07:50,202 --> 00:07:51,303
>> Mm-hmm.

175
00:07:51,303 --> 00:07:54,439
>> But the SBIR office
of Jennifer Van Pelt

176
00:07:54,439 --> 00:07:56,942
and Michael Vinceade
[phonetic] it was wonderful.

177
00:07:56,942 --> 00:07:59,411
They did a wonderful job
with us -- still doing --

178
00:07:59,411 --> 00:08:01,113
a wonderful job with more

179
00:08:01,113 --> 00:08:03,115
and more projects
that we have on this.

180
00:08:03,115 --> 00:08:04,216
>> Well Paul it takes a village.

181
00:08:04,216 --> 00:08:06,018
And we thank you for
sharing with us today.

182
00:08:06,018 --> 00:08:08,020
We can't wait to see
VEGGIE launch next year.

183
00:08:08,020 --> 00:08:09,488
And that will do it for us.

184
00:08:09,488 --> 00:08:11,189
From the Payload Operations
Integrations Center.